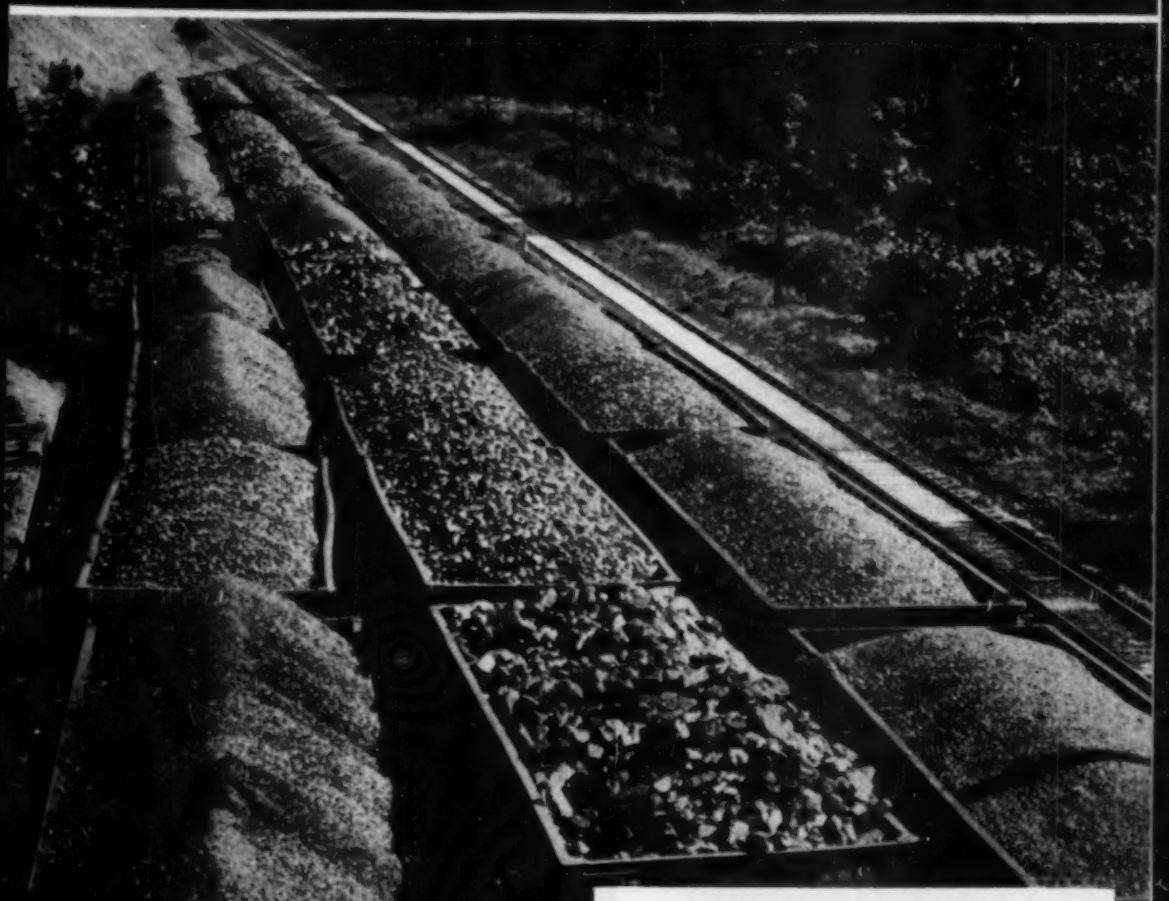
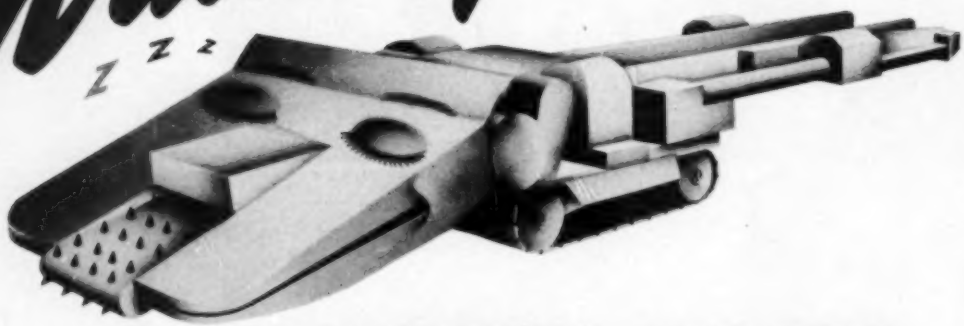
Coal Age



THE NEXT TEN YEARS . . . p 54

Conveyors on Wheels ● Chieftain No. 20 Story
New-Type Cable Splicing ● Eye Protection
Concord Mine ● Training Supervisors
Longer Timber Life ● Full Contents on p 5

NO LOADING MACHINE *Waiting...*

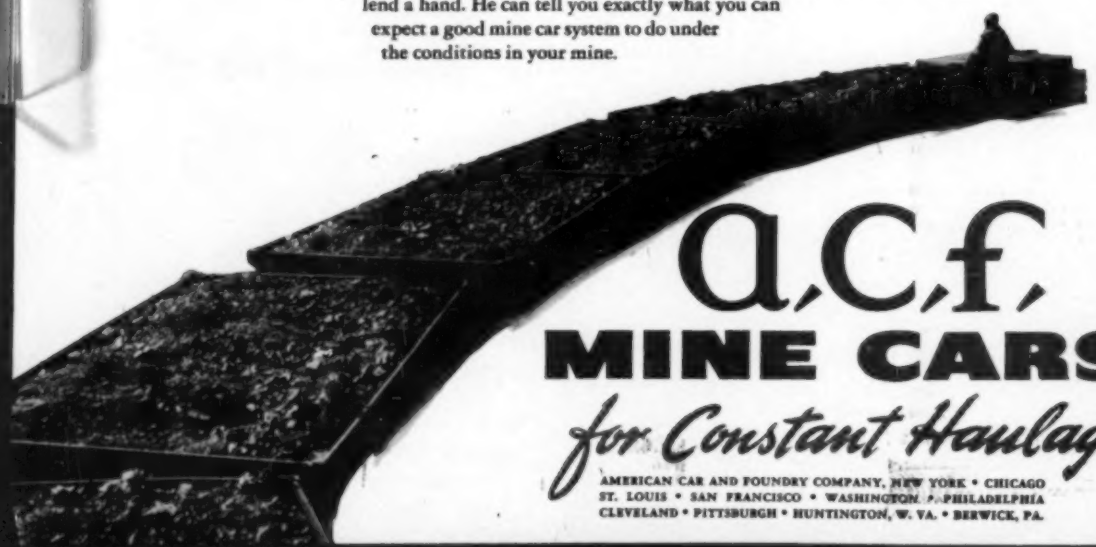


...with MINE CARS

Imagine how much you lose in $$ when big loading machines just sit...and wait. That's the cost of a breakdown in a one-unit haulage system. *That's what a multiple system of constant-haulage mine cars can save you!*

Just look at the one big difference between mine cars and a 'continuous' haulage system: *the time-out costs.* Repairs on mine cars are few, far between, and mostly quite inexpensive. Even more important—one car 'out' *doesn't stop your coal from moving!* If a car needs adjustment...onto a siding with it! Your loaders fill up the rest of the trip. Your men—all the way from the face to the tipple—keep normally busy. Your coal gets out *all* day...*every* day...when you use a complete mine car system. You *keep* the loading machines busy!

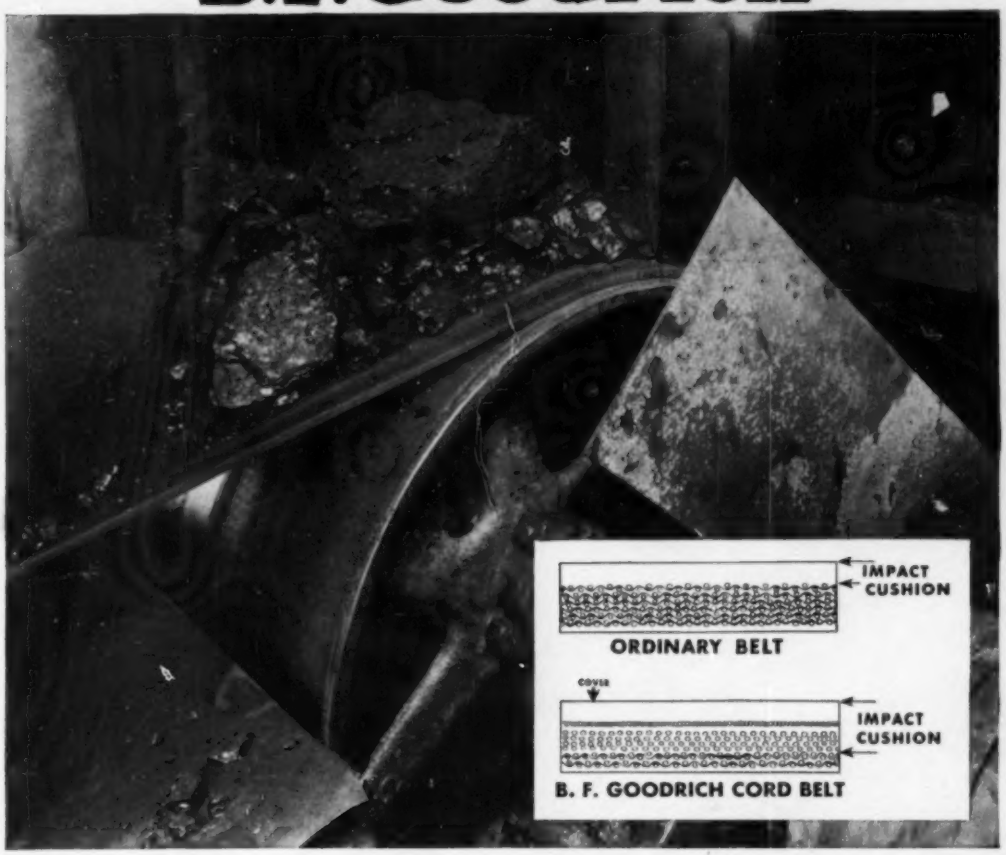
Next time you plan for modern haulage, let your nearby A.C.F. representative lend a hand. He can tell you exactly what you can expect a good mine car system to do under the conditions in your mine.



a.c.f.
MINE CARS
for Constant Haulage

AMERICAN CAR AND FOUNDRY COMPANY, NEW YORK • CHICAGO
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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



B.F.Goodrich cord conveyor belt

EACH lengthwise cord in a B. F. Goodrich cord belt is completely surrounded by rubber — no cross threads tie them together. These parallel cords are completely insulated from one another by rubber, free to "give" lengthwise and crosswise when an impact occurs. Thus the rubber can distort temporarily to distribute and absorb shocks that would damage a stiff, unyielding carcass. This augmented impact cushion means better belt service, longer belt life.

Cord belts trough better — Cord belts carry the load with less belt damage, less material "spill". Even thick, narrow cord belts trough naturally. And because they trough better, cord belts keep centered on the idlers, sustain less damage, require less maintenance. Longer centers, higher lifts can be used. Creasing action between idlers (as in a fabric-type belt) is eliminated.

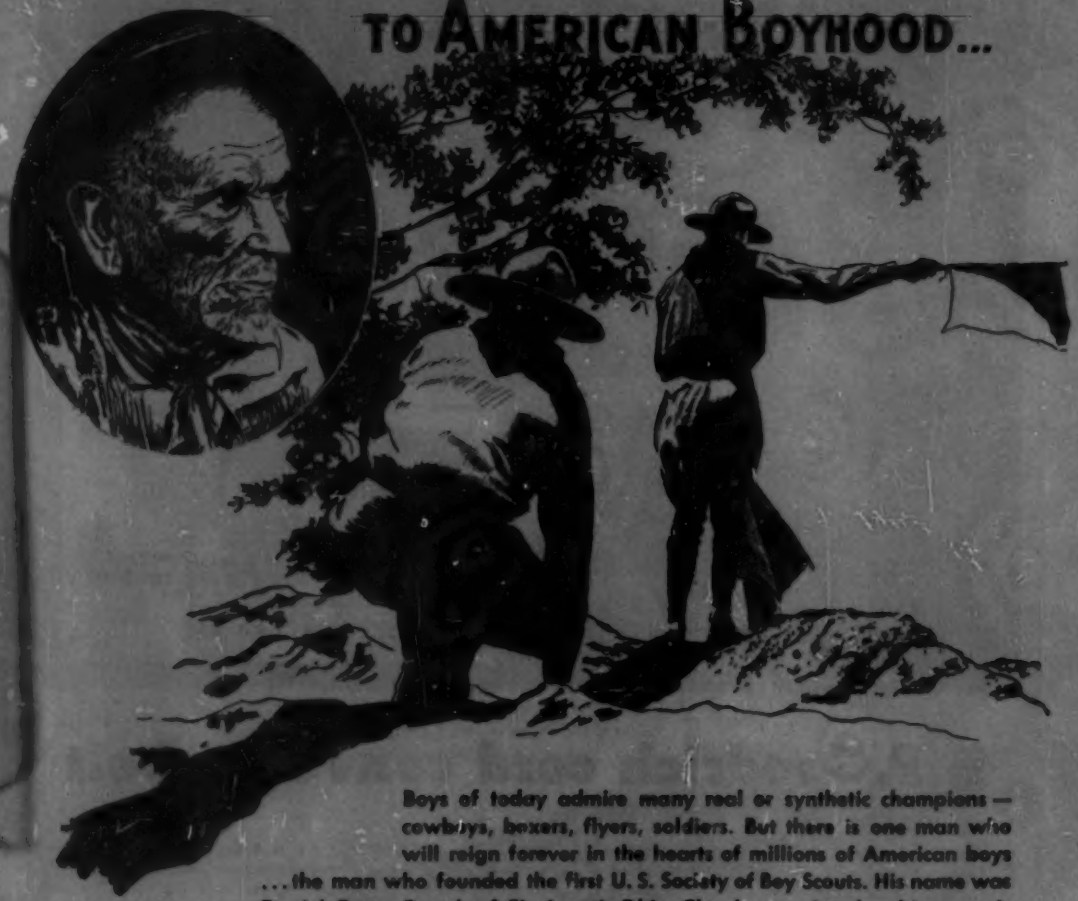
Cord belts last longer, reduce costs —The better impact cushion of cord construction resists cuts and gouges. A transverse cord "breaker" floated above and across the main cord section helps cushion impact, keeps the cover from stretching beyond elastic limits, and provides better adhesion between cover and carcass. With each cord completely sealed in rubber, this belt resists the effects of acid materials, moisture, mildew.

Cord belts for tough jobs — If your belts must take severe impact on loading or "over the idlers", cutting and gouging at the loading chute, exposure to moisture and acid materials, heavy loads with long centers and high lifts, you need B. F. Goodrich cord belts. Your local distributor will show you how they can save you money. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Conveyor Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

The Champion

HE OPENED A NEW WORLD... TO AMERICAN BOYHOOD...



Boys of today admire many real or synthetic champions — cowboys, boxers, flyers, soldiers. But there is one man who will reign forever in the hearts of millions of American boys ... the man who founded the first U. S. Society of Boy Scouts. His name was Daniel Carter Beard, of Cincinnati, Ohio. Closely associated as his name is with Scouting, it is not so well known that he was a fine artist; President of the Society of Illustrators; a magazine Editor; a writer of many books; an explorer of note; a Conservationist; and likewise a mighty fisherman. Dan Beard's claim to Championship for his services to young America is unique, well merited and undisputed.

HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

The Champion

...IN COAL MINE LUBRICATION



Hulburt Quality GREASE

"The Champion"

You can scout around all you want for a better Grease to lubricate your coal mining machines so they'll work longer, smoother and better—but you'll find no product closer to the hearts of hard-bitten really experienced coal mining men than Hulburt Quality Grease. Dan Beard could do many things well. Hulburt Grease is made to do just ONE thing and do it supremely well—i.e. perfectly lubricate coal mining machinery. Its service is outstanding, its prestige well merited and undisputed.

WHAT THESE TWO BIRDS CAN DO FOR *You*



Photos by Torkel Korling

THE BIRD COAL FILTER

gets the washed, fine coal as dry as can be obtained by any mechanical means, feeds being equivalent. Cost per ton is exceedingly low. Maintenance, as you schedule it, averages under 2 cents per ton, frequently under 1 cent per ton.



THE BIRD POLISHER

in some cases by itself, in others with settling equipment, gets the high ash, extreme fines out of the cleaning water, so that all or part of them can be discarded with the refuse. The water is in shape for re-use.

Many preparation plants are using these two BIRDS to lick otherwise difficult fine coal problems. May we tell you what they can do for you?

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

Coal Age



THIS MONTH'S COVER

• FULL COAL CARS typify the industry's long-range future of a consistently growing market demand. What predicted economic expansion will mean to the nation and how some coal companies are laying plans to capitalize on it is the subject of this month's lead feature (p 54). This feature also kicks off *The Executives' Forum*, where you're invited to sound off on any subject interesting to the industry (see p 56).

COMING IN COAL AGE

• **Watch February** for the two staff-written reviews of the industry's progress in 1950 and its prospects for 1951. Here you'll find, digested to conserve your time, a comprehensive analysis of industry accomplishments and trends in mechanical mining, labor, market demand, economics, research and public and government relations. Plus, of course, the latest official estimates of 1950 equipment sales and the industry's safety achievements.

• **P. & R's New Porter Tunnel**—A thorough description of anthracite's newest deep operation, opened through a 4,220-ft. tunnel at a development cost of $2 million.

• **Price Preparation Plant**—Methods and equipment involved in Inland Steel's program to develop some 30,000 acres of reserves, including a new 750-tph plant, new surface facilities and a 4½-mi haulageway.

• **How hydraulic car spotters** sharply reduced trip-change delays at belt-conveyor discharge points in the 1,600-tpd Watson mine of the Westmoreland Mining Co.

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CONTENTS • JANUARY • 1951

Editorial: Production and Leadership 53

Planning 10 Years Ahead 54
The Executives' Forum—Where coal men are invited to air their views.

Gathering Conveyors on Wheels 58
Wheeled Conveyors slash moving time in low coal for Inland Steel.

The Chieftain No. 20 Story—1 60
Parallel-Tandem Stripping—An important new "First" at Maumee Collieries.

The Chieftain No. 20 Story—2 65
Full details on the new Maumee-erected 600-tph preparation plant.

A New Cable-Splicing Method—CHESTER CONRAD 70
How Consol (W. Va.) makes splices underground in 20 min. at $1.50 each.

How Glen Alden Gets Longer Life From Timber—EDW. M. GRIFFITH. 74
Wood-preserving plant helps maintain almost 1,000 mi of haulageway.

Saving Through Eye Protection—WM. J. MAHER 77
Eye injuries are costly—Here's how to reduce them by 75% or more.

New T. C. I. Concord Mine and Plant 80
Modern mining methods and twin cleaning circuits spark 7,500 tpd mine.

The Benefits of Supervisory Training—R. B. HEWES 87
Why train supervisors—How do company and men profit from a program?

Delay-Type Air Shooting Saves Time and Adds Efficiency 92

Small Unit Collects Roof-Drill Dust 94

How to Drive Nails Under Water 94

Signal Cable Clamped Along Bare Feeder 97

Operating a Tractor Cold-Weather Starting System 97

Coal Men on the Job 90
Equipment News 102
Foremen's Forum 98
News Round-Up 115

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VOLUME 56 NUMBER 1
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Photo Courtesy General Electric Co.

When you pack grease-lubricated ball or roller bearings in mine locomotives, cutters, loaders and other equipment, with *Texaco Regal Starfak*, you're on the track to greater efficiency and savings. *Texaco Regal Starfak* stays in the bearings longer . . . resists washout . . . requires fewer applications.

Texaco Regal Starfak resists separation,

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leakage, oxidation and gum formations. It weathers temperature changes, stands up under rugged operating conditions. For longer bearing life and lower maintenance costs, you can't beat *Texaco Regal Starfak.*

For low-speed, heavy-duty, anti-friction bearings use *Texaco Marfak.* Its protection outlasts that of ordinary grease; consequently bearings last longer, maintenance costs drop.

Let a Texaco Lubrication Engineer help you select the proper cost-saving lubricants for your machinery. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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For the Coal Mining Industry

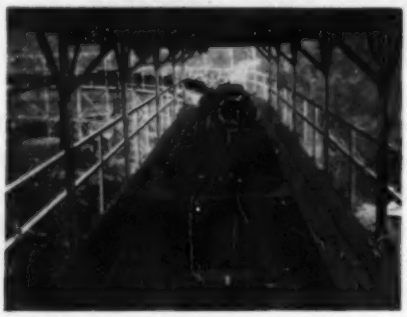
NOW . . . they are saving with 250 New

Another Actual Case on Record Where a Change Over to the S-D "Automatic" System of Coal Haulage Is Saving One Company Thousands of Dollars!

Last month we advised you of a small tonnage mine that is saving $24,000.00 annually, in man hours alone, after changing over to 16 new S-D 1-2-3 "Automatic" Mine Cars.

We told you that not every change-over, of course, offers the same opportunity for cutting costs, but in every case large savings are obvious. For instance, here is another actual case on record in which a large coal company reports that with the recent change-over to the S-D "Automatic" System of coal haulage, and installing 250 new S-D 1-2-3 "Automatics" they have been able to save 25 man-shifts per day. This is an approximate saving of $100,000.00 each year, based on 250 working days annually.

The S-D "Automatic" System comprises any number of required cars (usually one-third to one-half the old cars) plus an adequate storage bin. This combination has proved beyond question its advantages. A storage bin of sufficient capacity is essential to constant coal production and low cost operation. First, it permits full time mine operation with only part time operation of screening plant. Second, it guarantees independent non-stop operation of either screening plant or mine in case of temporary shut-down of one or the other. Use of the bin is possible only with drop-bottom "Automatic" cars and no other type of haulage. Regardless of size, S-D "Automatics" take full advantage of bin capacity and fill it level with tracks. This bin is, in fact, the control point between mine and screening plant for a balanced operation. Incidentally, the bin supplies the continuous, even flow of coal so necessary to effective screening plant operation.

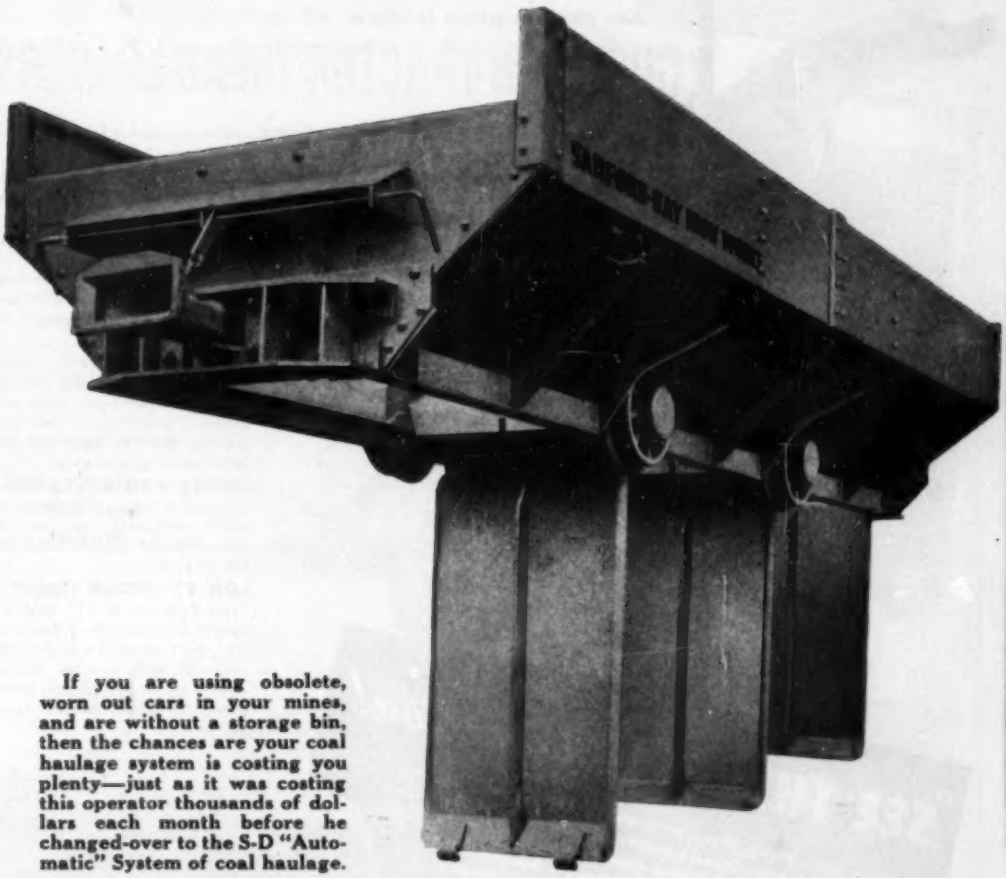


Today, transportation of coal from mine to bin, automatic dumping of coal at bin, 15 to 20 cars per minute and return of cars to mine, is done non-stop operation with S-D 1-2-3 "Automatics" and handled alone by the locomotive operator.



If something happens to close down your screening plant, mining goes right on until bin is full, because bin may be filled to level full with S-D 1-2-3 "Automatics." Only the S-D 1-2-3 "Automatic" System of haulage can do this.

$100,000^{00}$ Annually
S-D 1-2-3 "AUTOMATICS"



If you are using obsolete, worn out cars in your mines, and are without a storage bin, then the chances are your coal haulage system is costing you plenty—just as it was costing this operator thousands of dollars each month before he changed-over to the S-D "Automatic" System of coal haulage.

Let one of our engineers discuss improvements that will turn your losses into profits. Drop us a line today!

Sanford-Day Iron Works
KNOXVILLE TENNESSEE

The right combination...for loading

Before you decide on *any*...

see the exclusive features of

GOODMAN TRACTOR TREAD LOADERS



The Type 665 LOADER

A FAST, SMOOTH WORKING MACHINE—All movements effected through quickly responsive hydraulic touch control.

MINIMUM MANEUVERING—Straight-line loading, 18 foot cleanup with only forward and backward movement of this machine. The loading head can be swung to either side of center and has a vertical range for digging tight coal from below bottom to 30½" above.

ADJUSTABLE DISCHARGE—Discharge end can be raised or lowered to shuttle car height and can be swung horizontally over a full range of 80°.

HIGH CAPACITY—8 to 10 tons per minute in free loading coal. Action of gathering arms and chains is fast; flow of coal from loading head to discharge end is constant.

SAFETY FOR OPERATOR—Controls are grouped. Operator stands well back from face. All movements of machine are within range of vision.

LOW OR MEDIUM HEIGHT—Type 660 has a 22" coal line height and an over-all height of 31"; the Type 665 is higher (43" over-all) with greater ground clearance for soft bottom and is suited for discharge into large shuttle cars.

SEE THIS PAIR *in action!*

When you watch them perform together, you'll see why Goodman Tractor Tread Loaders and Goodman Shuttle Cars have been called an "ideal combination for peak performance". Write us today, and we'll have a Goodman field representative arrange a mine visit to show you this equipment on the job.



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and transporting

Before you decide on *any*...
see the advantages offered in

GOODMAN SHUTTLE CARS

BRAKES, SAFE AND RELIABLE—Easy to operate automotive truck type or airplane disc type hydraulic brakes. May be locked to hold car on incline. Supplementary emergency brake.

EASY TO OPERATE STEERING—Applied to all four wheels. Mechanical system with hydraulic booster. Operator turns the steering wheel; booster turns the wheels. Car can be steered manually with power on or off.

DRIVE OPTIONAL—Two or four-wheel with controls on right or left-hand side.

AUTOMATIC CABLE CONTROL—The cable reel, hydraulically driven, is automatic in operation, maintains correct cable tension at all times regardless of direction of travel.

CHOICE OF HEIGHT—A complete line of cable reel types in basic heights of 35" to 48" with and without adjustable discharge.



The Type 570 SHUTTLE CAR



Goodman 512 SHORTWALL COAL CUTTERS



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MINE CARS... *built as you want 'em*

Here at Bethlehem we are equipped to build the mine car you want, in the size you want—large, small, or in between. Eight-wheelers, four-wheelers; welded or riveted bodies. High-side or low-side types for end or rotary dump. All-steel, of course, and built for many years of the roughest, toughest service in any mine you can name.

That last is important. It means that the cars spend their time hauling coal—not loafing on the sidelines waiting for repairs. It means, too, that you needn't maintain elaborate, costly overhaul facilities.

Bethlehem is a veteran builder of good mine cars . . . been at it for years. We'll work with you right from the blueprint stage, using designs of our own or ones you furnish. Whatever your needs, we can fill them—with specifications fully met, down to the last small detail.

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BETHLEHEM STEEL

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FOR *NEW* PRODUCTION RECORDS



These entirely new Gar Wood dozers are perfectly matched for the new Allis-Chalmers HD-9 and HD-15 tractors. Engine-mounted hydraulic dozers have all hydraulic equipment in one compact streamlined "package" mounted over tractor radiator. Both hydraulic and cable dozers have new tilt screw at frame trunnions for easy and quick vertical blade adjustment. They have many other money-making features . . . ask your nearest Gar Wood—Allis-Chalmers dealer.

Matched with NEW ALLIS-CHALMERS HD-15 Tractor

- GAR WOOD Model CD-153 Cable Dozecaster (shown with Model 151 Front Mounted Control Unit)
- GAR WOOD Model CT-153 Cable Tipdozer
- GAR WOOD Model HD-153 Hydraulic Dozecaster
- GAR WOOD Model HT-153 Hydraulic Tipdozer

Matched with NEW ALLIS-CHALMERS HD-9 Tractor

- GAR WOOD Model HT-93 Hydraulic Tipdozer (shown)
- GAR WOOD Model HD-93 Hydraulic Dozecaster

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MANUFACTURERS OF GAR WOOD TRACTOR EQUIPMENT FOR ALLIS-CHALMERS INDUSTRIAL TRACTORS

GAR WOOD GW INDUSTRIES

SEE INSIDE

now TWO MORE

HD-9

WEIGHT: 18,500 lb.
70 DRAWBAR Hp.
GM 4-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.68 mph.;
3 reverse, to 4.43



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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

The World's Most Modern Line of Crawler Tractors


Here's
BIG NEWS
for Tractor Users

Completely New Allis-C

NEW POWER RATING

POWER, WEIGHT, BALANCE put them in a class of their own — never such traction . . . such pulling, pushing or lifting ability. And the smooth-operating GM 2-Cycle Diesel engines work without strain under the most extreme conditions.

NEW STRENGTH

All parts are designed and built to carry their loads with a margin of safety. No need to go to a larger tractor just for strength alone. The HD-9 and HD-15 set new standards for tractor quality.

NEW DESIGN SIMPLICITY...

for Easier Control and Greater Operator Comfort— Easy-shift transmission • Self-energizing brakes • Booster steering controls • Adjustable, cushioned seat • Wide arm rests • Convenient controls and pedals • Full visibility • Instant electric starting.

for Simplified Servicing—Unit construction permits removing major assemblies without disturbing companion groups • Extended lubrication periods throughout—1,000 hours on truck wheels, idlers and support rollers.

Complete Line of Matched Equipment, Developed in Cooperation With Allied Manufacturers, Available For Both The HD-9 and HD-15

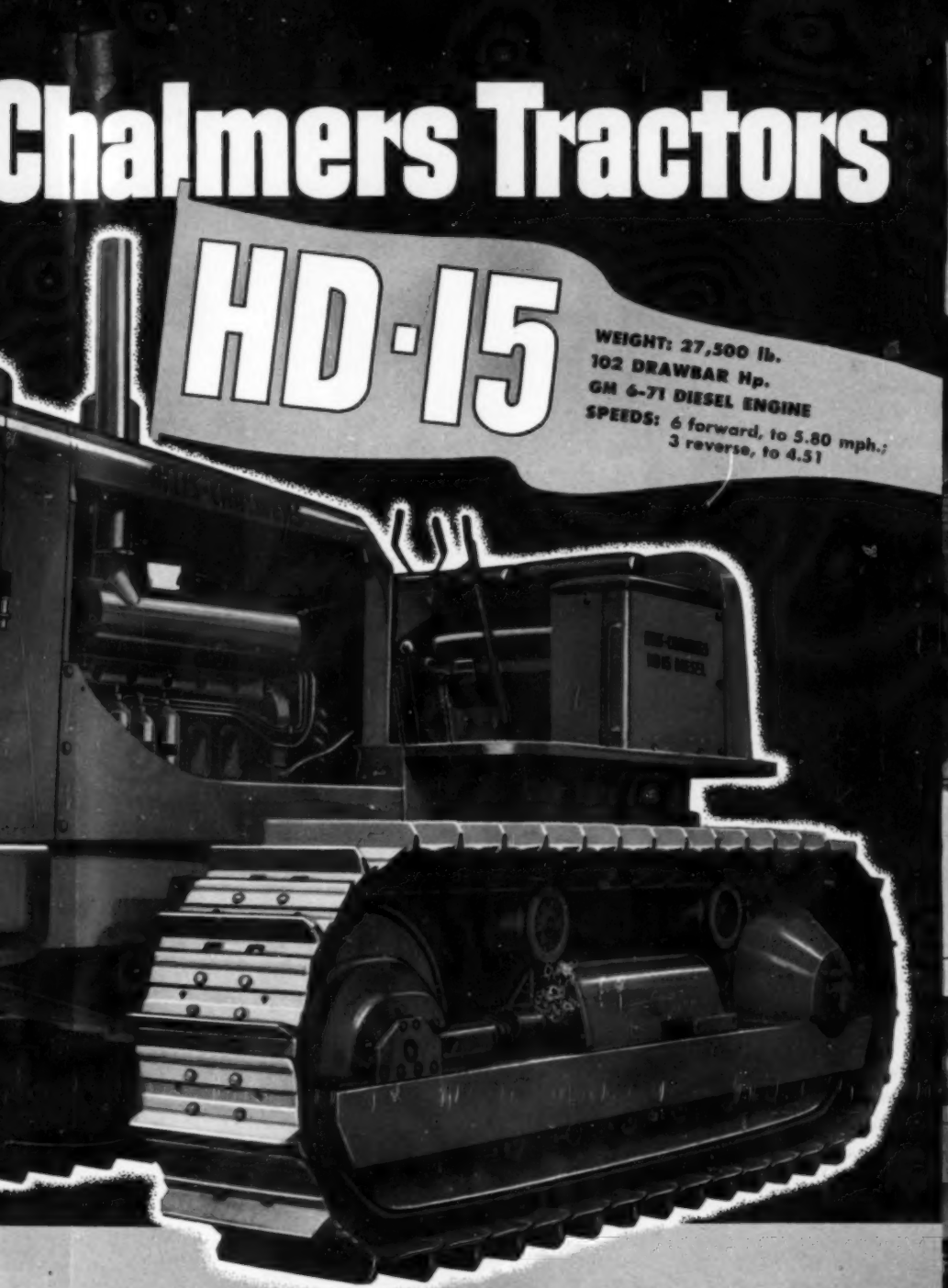
✓ For Greater Production
✓ For Easier Operation
✓ For Simplified Servicing

OUT AHEAD Mod sets

Chalmers Tractors

HD-15

WEIGHT: 27,500 lb.
102 DRAWBAR Hp.
GM 6-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.80 mph.;
3 reverse, to 4.51



Modern Allis-Chalmers Line sets New Tractor Standards



Each of these four Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each brings you a new kind of performance . . . plus new strength, operator comfort and service simplicity. For the finest in crawler tractors, see your Allis-Chalmers dealer.




Here's
BIG NEWS
for Tractor Users


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DRY GOODS
Introducing
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NEW ACTORS
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A-C Tractors
"An Earthy Show"
The RIPPER
HEADLINERS


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DRY GOODS
Introducing
3
NEW ACTORS
for your
AC Tractors
"An Earthy Show"
The RIPPER
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ON ANY SHOW · ANY WEEK !

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THE BAKER MANUFACTURING COMPANY

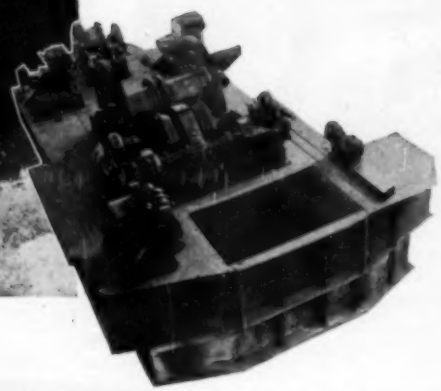
SPRINGFIELD, ILLINOIS

Specialists in Hydraulic and Cable-Controlled Earthmoving Equipment for 43 Years

Loads 30 tons a minute —electrically!



1 With a 17-yard dipper and an 85-foot boom length, this new loader needs only five passes, averaging 35 seconds each, to load a standard 75-ton coal car! Thanks to G-E amplidyne control of hoist, swing, and crowd motions, the operator gets instant-acting response from the huge shovel, plus fast acceleration and deceleration that cuts cycle time to a minimum. With main drive completely G-E equipped, this world's largest coal loader contains motors totalling some 2000 horsepower.



AMPLIDYNE-CONTROLLED

SHOVEL DRIVES

. . . to cut mining costs!

2 Muscle power for the loader—shown in this view of machinery deck during assembly—includes two 187½-hp hoist motors (foreground), two 75-hp vertical swing motors, and a 75-hp crowd motor (background). G-E MD series motors—the toughest G-E shovel motors ever built—permit handling heavier loads safely at higher maximum speeds, provide more hp per frame size, require less inspection and maintenance.



3 This mammoth strip shovel—the loader's teammate and also electrically equipped throughout by General Electric—can pick up a load of overburden with its 20-yard dipper and drop it 300 feet away! In addition to amplidyne control of all motions, it utilizes a G-E amplidyne power-factor regulator that substantially reduces voltage variation, permits more efficient operation of the equipment.



World's largest loading shovel—together with giant stripper—relies on G-E equipment to help maintain average output of 100 tons of coal per man per day at Foley Bros. Inc. operation near Colstrip, Montana!

4 Hoist, swing, and crowd motors in the stripper are precisely governed by its G-E amplidyne control, shown mounted atop G-E motor-control cabinet inside the shovel house, with G-E switchgear at left. Small and compact, it uses fewer control devices, takes up minimum space, protects equipment against excessive current and torque peaks.



5 Incoming a-c power, protected against outages by neutral grounding, is converted to d-c by this 7-unit motor-generator set. Neutral grounding assures maximum protection for operating personnel and minimum equipment shut-downs in case of any line-to-ground fault. On large shovels of this type, designed to pay off by continuity of operation and high output, this is an especially important factor.



6 These two G-E 250-hp hoist motors, as well as the stripper's other motors, are of extra-tough construction for extra-heavy duty. They feature removable top portion for easy inspection and maintenance—right on the shovel—without disturbing motor alignment. Removal of external connections and four bolts provides easy access to armature and brush holders.

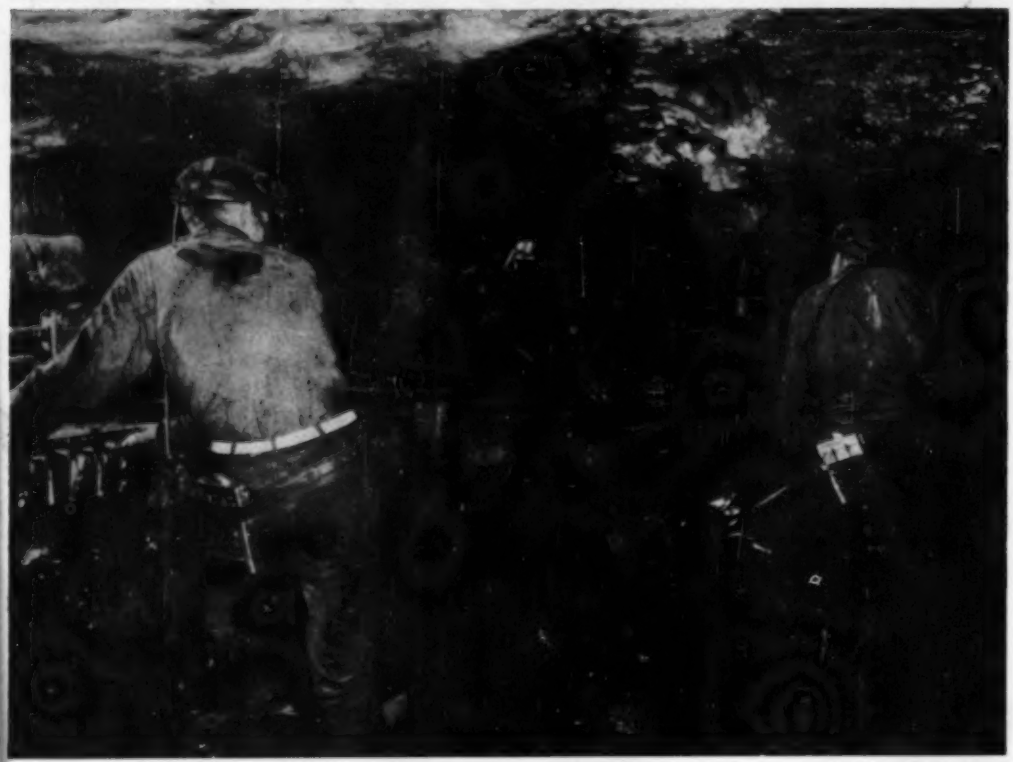


7 Like the stripper's hoist and crowd motors this G-E 125-hp vertical swing motor, one of two, is built for extra-tough jobs. Literally thousands of shovels and draglines have been electrified by G. E. to boost output, cut costs. This experience is at your service when you call in a G-E mining specialist, or specify G-E shovel equipment. Send for Bulletin GEA-4843, "More Yards Per Day." *Apparatus Department, General Electric Company, Schenectady 5, New York.*

GENERAL ELECTRIC

660-11

FOR LOWEST COST PER TON



All that's needed in a shift's cutting operation is a pocketful of Bowdil Throw-away Bits per machine. This ease of hand-ling and changing make Bowdil Bits popular with MACHINE operators . . . long life and coarse cuttings at low cost make them popular with MINE operators. And there's no economy in resharpening bits when you get so many tons per point.

BOWDIL
COAL CUTTING EQUIPMENT
CANTON OHIO

OUT AHEAD

with GM DIESEL POWER!



HD-20—41,800 lbs. of properly balanced weight; long, wide sure-gripping tracks and the new GM 6-110 Diesel engine driving through hydraulic torque converter give the Allis-Chalmers HD-20 brute strength to take toughest jobs in stride.

HD-15—27,500 lbs.—102 Drawbar H.P.—powered by a 6-cylinder GM Series 71 Diesel engine.



HD-9—18,500 lbs.—70 Drawbar H.P.—powered by a 4-cylinder GM Series 71 Diesel engine.

General Motors 2-cycle Diesel engines supply the hard-hitting power that enables Allis-Chalmers' great new line of tractors to outwork all others.

Four and six-cylinder GM Series 71 engines driving the HD-9 and HD-15—and the powerful new GM 6-110 engine driving the HD-20—give these new tractors a reserve of smooth, dependable power for easy handling, increased work and minimum maintenance.

The greater efficiency of 2-cycle operation and direct fuel injection simplifies design and enables these engines to produce far more horsepower than other Diesels of equal size and weight. Interchangeability of Series 71 engine parts provides maximum availability—keeps them on the job.

That's why GM Diesel engines are chosen to power not only the "World's most modern line of crawler tractors"—but more than 500 different kinds of machinery built by 120 manufacturers.

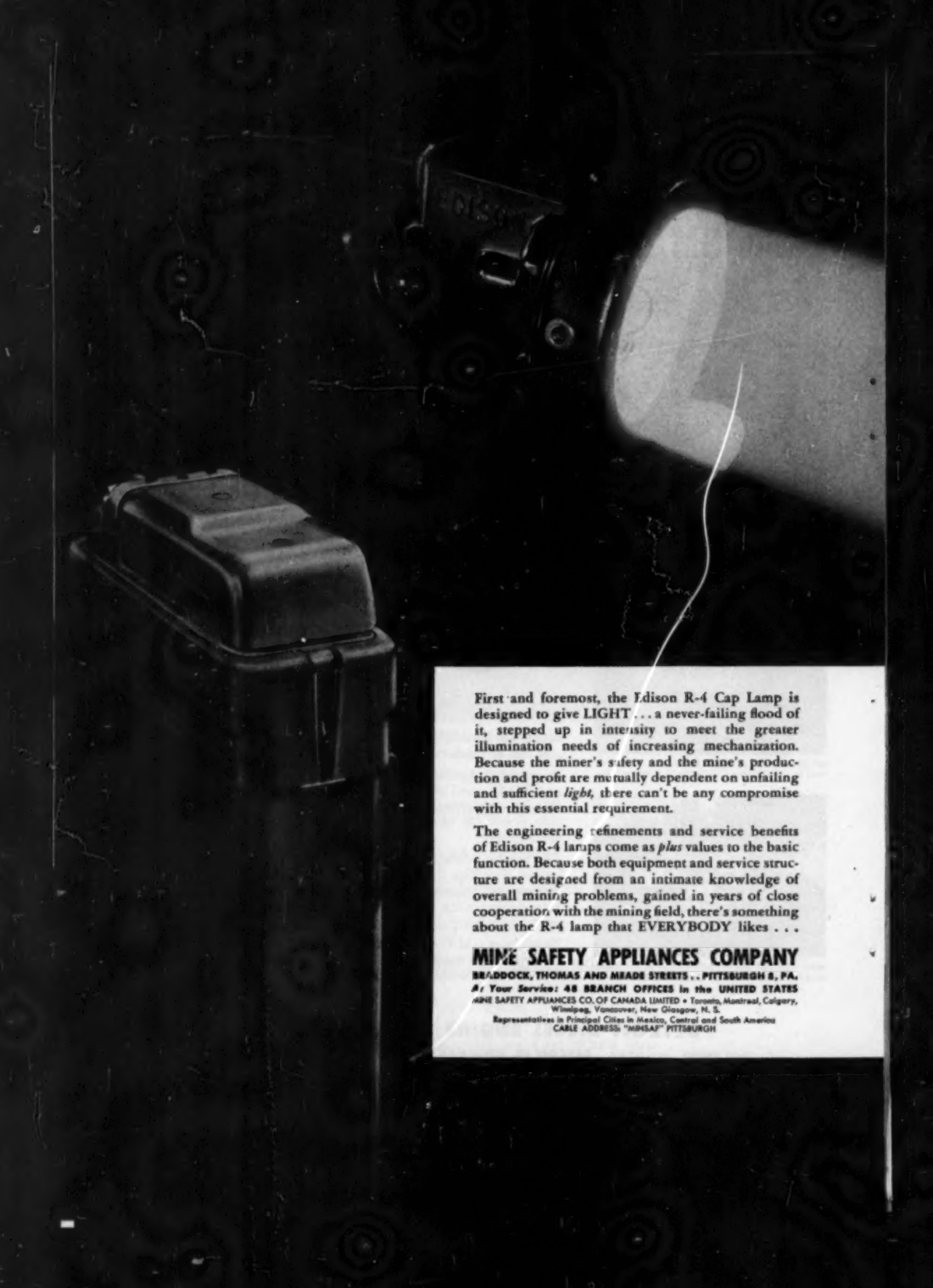
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SINGLE ENGINES ... Up to 275 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS ... Up to 800 H.P.

GENERAL MOTORS

GM DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK



First and foremost, the Edison R-4 Cap Lamp is designed to give LIGHT . . . a never-failing flood of it, stepped up in intensity to meet the greater illumination needs of increasing mechanization. Because the miner's safety and the mine's production and profit are mutually dependent on unfailing and sufficient *light*, there can't be any compromise with this essential requirement.

The engineering refinements and service benefits of Edison R-4 lamps come as *plus* values to the basic function. Because both equipment and service structure are designed from an intimate knowledge of overall mining problems, gained in years of close cooperation with the mining field, there's something about the R-4 lamp that EVERYBODY likes . . .

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MAINTENANCE: "Edison equipment makes my job easier. Lamps are easy to service, and batteries last for years. And the MSA training course taught me how best to handle lamps and get the most out of them."



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A&G engineers work for the client alone — above and below ground. Mines have been planned, preparation plants designed, and built for nearly every seam of coal being mined in the United States today.

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UNDERGROUND CONVEYORS
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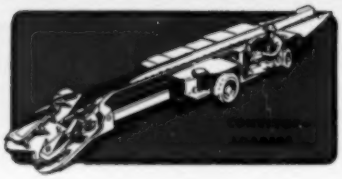
So you can select a Jeffrey Conveyor, Chain or Belt type, with the utmost confidence that it will meet your requirements for capacity and nature of service. These Engineers know how to provide for low initial investment . . . the greatest efficiency and economy.

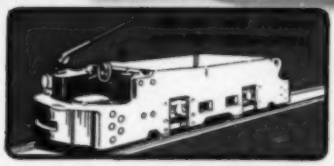
Give them a chance to help you.

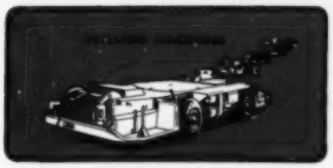


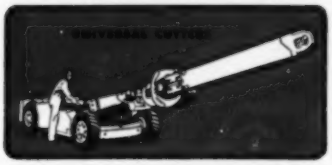
Jeffrey 61-AM Room Conveyor with power unit mounted at side on leveling base. Maximum length 300 ft.—capacity 1 to 1.5 T.P.M. (Patented)



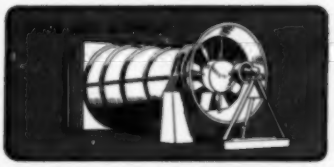


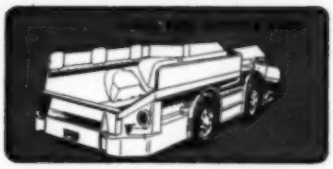


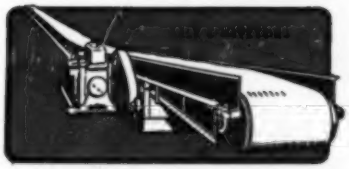


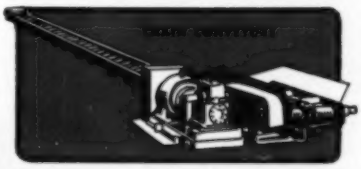














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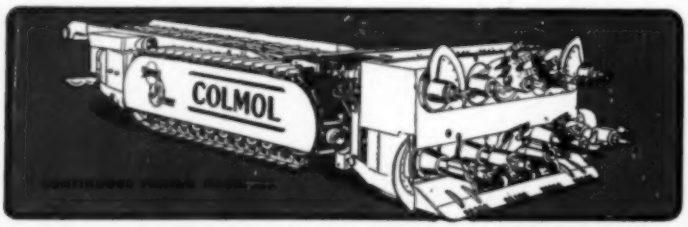
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CLEVELAND 15, 1560 Hanna Bldg.
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JACKSONVILLE 2, Barnett Bank Building
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Webb Coal Mining Company
West Gulf Collieries
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Coal Processing Corporation
Jewell Ridge Coal Corporation
King Cole Mining Corporation
Page Pocahontas Coal Corporation (2)
Sycamore Coal Corporation

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Big Jim Coal Company
Black Star Coal Corporation
Blue Bird Mining Company (2)
Blue Diamond Coal Company
Cinderella Coal Corporation (2)
Columbus Mining Company
Correale Coal Mining Corporation
Creech Coal Company
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Elkhorn Coal Company
Elkhorn Jellico Coal Company (2)
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Knott Coal Corporation
Marlowe Coal Company
Mary Gail Coal Company
New Big Creek Mining Company (The) (2)
Norton Coal Corporation
Smith Coal Company
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Stoker Coal Company
West Kentucky Coal Company

TENNESSEE

Straight Fork Coal Company

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The Berwind-White Coal Mining Company
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Charles E. Campbell
Culmerville Coal Company
Delmont Fuel Company
Evans Coal Company
Ebensburg Coal Company (2)
Johnstown Coal & Coke Company
Marco Coal Company
Penn Valley Mining Co. Inc. (5)
Pittsburgh Coal Company
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The David Z. Norton Company
Pittsburgh Plate Glass Company
Rail & River Coal Company
Warner Collieries Company.....(3)

ILLINOIS

Bell & Zoller Coal & Mining Company.....(3)
Blue Bird Coal Company.....(2)
Carmac Coal Company
Chicago, Wilmington & Franklin Coal Co.....(3)
The Consolidated Coal Company.....(3)
Cutler Coal Company
Dering Coal Company
Franklin County Coal Corporation
Freeman Coal Mining Corporation
Mid-Continent Coal Corporation
Moffat Coal Company.....(5)
Edward Mohn & Son
Old Ben Coal Corporation.....(6)
Peabody Coal Company.....(2)
Perry Coal Company
Pschirrer & Sons Coal Company.....(2)
Sahara Coal Company
Schull-Mocke Coal Corporation
Truax-Traer Coal Company
Union Colliery Company
Wilkins Coal Company

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Glendora Coal Company
Ingle Coal Corporation
Knox Consolidated Coal Corporation
Linton Summitt Coal Company
Pandora Coal Corporation
Princeton Mining Company
Pyramid Coal Corporation
Rudolph Oil and Coal Company.....(2)
Snow Hill Coal Corporation
Standard Coal Company.....(2)
Templeton Coal Company
Viking Coal Corporation.....(2)
Wolf-Koeniq Corporation

OKLAHOMA

Buck Creek Mining Company
Davis & Swindle
Premium Smokeless Coal Company
Reliance Smokeless Coal Company

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Bear Coal Company
Black Diamond Fuel Company
Boulder Valley Coal Company
Calumet Fuel Company.....(2)
Canon Black Diamond Coal Company.....(2)
Canon Monarch Coal Company
Canon National Coal Company
Centennial Coal Company
Chandler Coal Company.....(2)
Clayton Coal Company.....(3)
Colorado Fuel & Iron Corporation
Colowyo Coal Company
Consolidated Coal & Coke Company
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Cribbe-Goodman Coal Company
Domestic Coal Company
Double Dick Coal Company
Dry Creek Coal Company
Grades Coal Company
Griffith Coal Mining Company.....(2)
Imperial Coal Company
Juanita Coal & Coke Company
Keystone Coal Company
Liley & Merlino
Louisville Lafayette Coal Company
McNeil Coal Corporation
William E. Russell Coal Company
Tomahawk Coal Company
Victor-American Fuel Company
Western Colorado Coal Company

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Bair-Collins Coal Company
Brophy Coal Company
Jeffries Coal Company
Johnson Coal Company
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Sheridan-Wyoming Coal Company
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Smokeless Coal Company

CANADA

Century Coal Limited.....(2)
Lethbridge Collieries, Limited
The Monarch Coal Mining Company, Limited
Red Deer Valley Coal Company, Limited
West Canadian Collieries, Ltd.....(2)

MEXICO

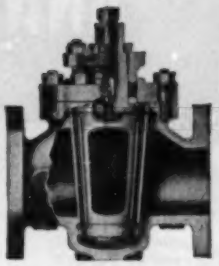
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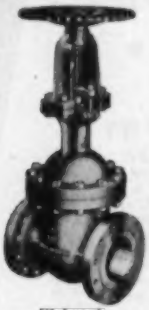
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• VALVES

• PIPE FITTINGS



Walworth
Lubricated Plug Valve



Walworth
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Walworth manufactures a *complete line* of valves and pipe fittings: all made to the highest standards of quality, both as to dimensional accuracy and metallurgical properties. In design, construction, and performance, Walworth products reflect more than a century of experience in the manufacture of quality valves and fittings.

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CUT your COSTS

CUTTING YOUR COST OF HAULING COAL—is just one of the problems you as a mine car operator face daily. We are proud of the opportunity many hundreds of mine operators have given us to help them solve this important cost item. We think the operation of over 500,000 Timken equipped mine cars is tangible proof of the Timken bearing's ability to deliver the lowest possible bearing cost per ton of coal hauled. Thirty-five years of experience in selecting bearings for various car sizes—in developing bearing mountings for different car and wheel designs—and in designing numerous adjusting and sealing parts has produced a complete line of Timken bearings and auxiliary parts for every conceivable mine operating condition.

No other anti-friction bearing is so capable of giving the long, trouble-free life in mine cars or mining equipment as the Timken tapered roller bearing. It takes a tough bearing to meet the tough operating conditions found in the mining industry.

Here's what Timken gives you:

1. **SHOCK LOADS** are easily carried by Timken Tapered Roller Bearings because they are made from case-hardened Timken Fine Alloy Steel. The tough inner core of the rollers and races takes the smashing impacts encountered in mine car service while the hard surfaces of these parts keep wear to a minimum. Over 50 years of experience and proven heavy-duty performance is behind the Timken Tapered Roller Bearing.

2. **MAXIMUM CAPACITY** is found in Timken bearings because loads are carried on a line contact between tapered rollers and races. The cone rib maintains roller alignment—skewing is eliminated. Result: even distribution of load on rollers gives maximum bearing capacity. Cars take curves easier because Timken bearings are built to take both radial *and* thrust loads in any combination, eliminating extra thrust bearings or thrust washers. Timken bearings reduce friction to a minimum, making possible faster starts with maximum train lengths.

3. **SIMPLICITY OF DESIGN** in the Timken mine car wheel, as shown in the drawing at right, provides for easier inspection of bearings. Assembly and disassembly does not become a laborious problem. By merely pulling the cap, cotter pin and nut, wheels may be easily removed for bearing inspection.

4. **PERIODIC LUBRICATION** is a prime necessity for longest mine car bearing life regardless of the type of bearing used. There is no substitute for flushing old—dirt and moisture laden grease out of the bearings and replacing it with fresh — live — protective grease. It's cheap insurance for trouble-free car operation.

5. **ADJUSTABLE FEATURE** of the Timken bearing mounting permits mine car operators to get maximum bearing life. Experience indicates that Timken bearings in well maintained cars show practically no wear. However, if wear does occur due to contamination of the lubricant, the resulting bearing looseness can be removed by tightening the nut and thus bringing the bearings back to their original setting.

6. **THE DUST COLLAR** shown is a simple and effective seal. It permits flushing of old grease from the bearings when new lubricant is added, making periodic lubrication more effective.

of hauling Coal!



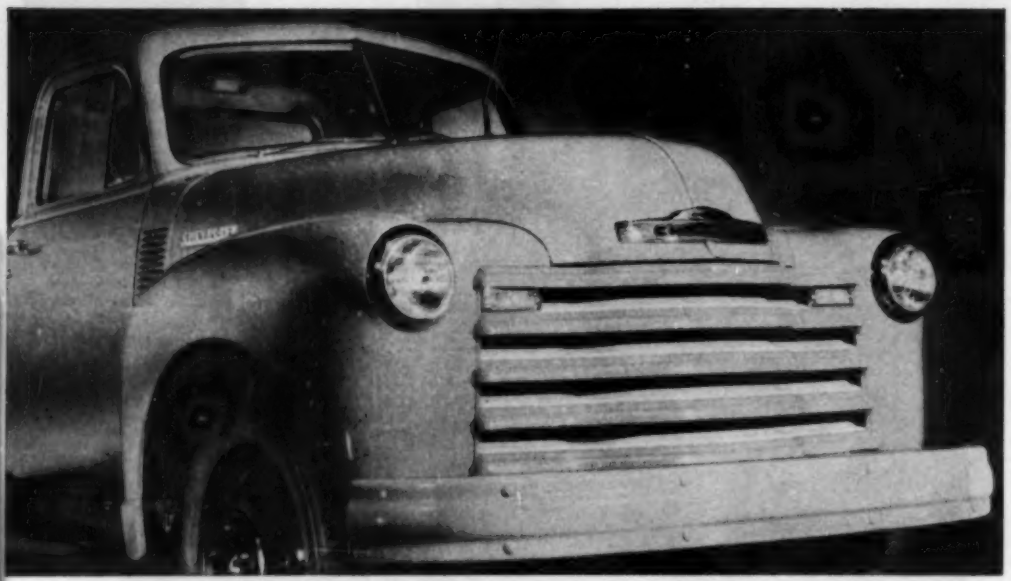
Write for your copy of this valuable book showing how Timken bearings are applied to all types of mining equipment.

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NEW 1951
CHEVROLET ADVANCE-DESIGN TRUCKS



New FEATURES! New QUALITY! New VALUE!

You'll find everything in these new 1951 Chevrolet trucks—everything that has made Chevrolet the world's most popular make *plus* new features and improvements that put them still farther ahead of the field. As a truck user, you'll welcome Chevrolet's new, better designed brakes for their increased effectiveness . . . their thrifty long life and extra safety! You'll recognize important contributions to trucking in Chevrolet's Dual-Shoe parking brake, the new Ventipanes, and Chevrolet's new cab seats . . . the very tops for riding comfort! See your Chevrolet dealer and take a good look at these 1951 Chevrolet trucks at your first opportunity. The "best in the business" are better than ever today! Chevrolet Motor Division, *General Motors Corp.*, Detroit 2, Mich.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHRO-MESH TRANSMISSIONS**—for fast, smooth shifting • **HYPOID REAR AXLES**—for dependability and long life • **NEW TORQUE-ACTION BRAKES**—for light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—for medium-duty models • **NEW TWIN-ACTION REAR BRAKES**—for heavy-duty models • **NEW DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **NEW CAB SEATS**—for complete riding comfort • **NEW VENTIPANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGN BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET

ALL ROPES *look* ALIKE... but



IN

GRAIN SIZE OF STEEL IS ALWAYS UNIFORM

What has grain size of steel to do with longer rope life?

Plenty!

That's because in every commercial grade of wire rope, there's a certain critical grain size that gives highest resistance to bending fatigue. In Wickwire Rope we make sure that you get this definite grain size and that it is always uniform to exacting McQuaid-Ehn* standards.

Only a fully integrated company like Wickwire can give you this big advantage...because such control of grain size is possible only where all phases of manufacture are under constant check and test...starting with the melting and refining of the steel and continuing through heat-treating processes and cold drawing of the wire.

Here again—Wickwire goes "beyond specifications" to give you assurance of wire rope that can't be beat for reliability, safety and longer life.

*For detailed information on the McQuaid-Ehn test, write to our Sales Office, at Palmer, Mass.

LOOK FOR THE YELLOW TRIANGLE ON THE REEL



Automatic heat control in our patenting or heat treating furnace operates within such close limits that the temperature in the furnace never varies more than a small fraction of one per cent.

WICKWIRE ROPE

CFI

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Casper • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Houston • New York Odessa (Tex.) • Philadelphia • Tulsa

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

3 TOURNAROCKERS "very satisfactory on Pine Canyon project"





LeT

Mail today to: **R. G. LeTOURNEAU, Inc., Peoria, Illinois**

NAME _____ TITLE _____

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Type work _____

☐ Send us more information

☐ Have Distributor call about: 35 m.p.h., 16-ton Tournarocker

Also interested in:

☐ 26 m.p.h., 9-ton Tournarocker

☐ 30 m.p.h., 25-ton Tournarocker

GOODFELLOW Brothers, Inc.,

tackled one of the northwest's toughest highway jobs . . . relocating 4.4 miles of U. S. 2 along steep sidewalls of rocky Pine Canyon, near Wenatchee, Washington. With over 600,000 yards of shovel rock to be carved out of the cliff face, some of the material is side-cast . . . much of it has to be hauled and dumped along the mountainside trail to widen narrow sections. Goodfellow Brothers, Inc., assigned the most difficult hauling to 3 LeTourneau 16-ton, rear-dump Tournarockers . . . and according to James B. Goodfellow "They are working out *very* satisfactorily".

Here are contractor's own figures

Loading under a 2-yard rock shovel, the Tournarockers carry 9 to 11 bank yards each trip. On one 2800-foot, one-way haul, actual job records show that Tournarockers easily handle shovel production of 1000 yds. every 8-hour shift. This rate of production, day in, day out, helps keep the job on schedule in spite of the rough haul roads, steep grades, and confined hauling conditions at altitudes of 2000 feet.

13' 9" turn radius speeds handling

Short, 90° turns, and positive electric steer by push-button control, permit easy turning and spotting anywhere along the narrow trail for load and dump position. Oversize, disc-type air brakes on all 4 wheels (4176 sq. in. total braking surface) give operators complete safety throughout the hauling cycle. Positive holding action of 4-wheel brakes . . . plus front-wheel drive on 186 h.p. Tournapull prime mover . . . let the Tournarockers dump safely out over the edge of mountainside fills. Simple electric hoist raises body to vertical position . . . streamlined bowl clears loads instantly.

Important savings for you

These same revolutionary Tournarocker advantages that are helping Goodfellow Brothers, Inc., lick steep slopes and rough going on the Pine Canyon project offer new low-hauling costs for your jobs, too. Ask your LeTourneau Distributor about this 16-ton, rear-dump Tournarocker. He can also give you complete information on 9-ton and 35-ton Tournarockers . . . and will show you money-saving interchangeability with Carryall Scrapers, bottom-dump hoppers, cranes, flat-beds and other auxiliary hauled units. Your investment dollar provides steady year-round earnings with interchangeable auxiliary units at approximately 25% of the cost of the original unit. Write or call NOW!



Big target . . . Operator on Goodfellow Brothers' 2-yard shovel has large target with Tournarocker's 12' 5" x 8' top opening . . . speeds shovel swings, has less spillage.



Rock body . . . Here's a typical load of big-chunk rock carried by Tournarockers along Pine Canyon's slopes. 186 h.p. for 16-ton capacity licks the toughest hauling conditions.



90 turns with positive power steer . . . Short 13' 9" turning radius is an important advantage where operators have to turn and dump their loads along these narrow trails.



Front-wheel drive . . . Means you can keep the drivewheels of the prime mover on firm ground. Front or rear wheel air brakes can be set independently.

LETOURNEAU PEORIA, ILLINOIS **TOURNAROCKERS**

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

MAKING A **TOUGH** CABLE

Tougher!

Stripping off the lead sheath after a Tirex Cable has been "Cured-In-Lead"



... That's what the "Cured-In-Lead" process is doing for every TIREX portable cable — adding extra wearability to their Selenium Neoprene Armor to assure long, trouble-free service under the most severe operating conditions.

HERE'S HOW IT'S DONE

Before jacket vulcanization the cable is run through a lead press which forms a lead "pipe" snugly around the jacket. During vulcanization this pipe firmly holds the cable, preventing any distortion of the jacket while it is still soft and pliable and assuring maximum density. When vulcanization is completed the lead is stripped off leaving an extra-tough jacket that needs no additional protection.

HERE'S WHAT IT DOES

It produces a jacket that is unexcelled for effective resistance to abrasion and rough handling ... provides it with a smooth outer surface which slides easily around obstructions without cutting or tearing ... maintains uniform diameter, assuring easy and compact reeling or coiling ... furnishes the means for positive identification of the size, type, number of conductors, and operating voltage of each cable as markings inside the lead pipe can be transferred to the jacket during vulcanization.

All TIREX Cables, and TIREX Cords too, are cured in lead. They are made in sizes and types to meet the requirements of all portable electric equipment. For a complete description of the "plus values" they provide, write us today for Folder 993.

SIMPLEX-TIREX

SIMPLEX WIRE & CABLE CO.
79 Sidney Street
Cambridge 39, Mass.

CUT COAL UNLOADING COSTS 2 WAYS

ALLIS-CHALMERS CAR SHAKER

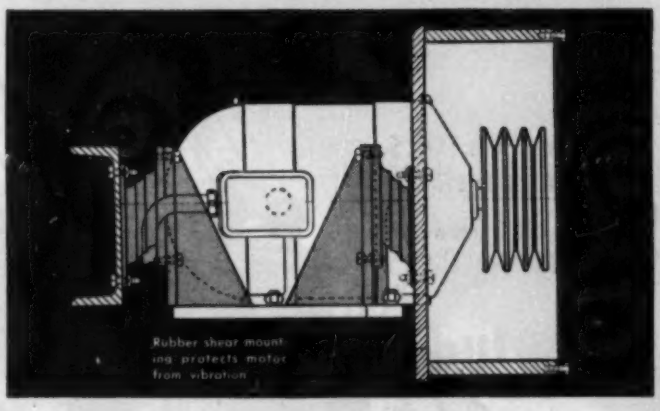
1. SAVE MAN-HOURS

In just a few minutes a hopper-bottom carload of coal screenings can be emptied with the new Allis-Chalmers Car Shaker. Labor is saved at the unloading station. Expensive demurrage costs may be avoided!



2. SAVE MAINTENANCE

Simplified mechanism has minimum of working parts to maintain. Driving motor is 15 hp, high-torque, totally-enclosed... mounted on rubber to protect against vibration! (Note rubber motor mount at right) Steel body is stress-relieved.



HERE'S A CAR SHAKER that is built to withstand severe vibration necessary for fast unloading of bridged and packed coal from hopper-bottom cars.

Its simplified mechanism . . . its unique arrangement for hydraulically removing self-aligning bearings for replacement purposes . . . and *many* other features pay off in low maintenance and long service!

Bulletin 07B7221 gives you more facts. Contact your nearby Allis-Chalmers Sales Office. Or send in the handy coupon.

ALLIS-CHALMERS

ALLIS-CHALMERS, 968A SO. 70 ST.
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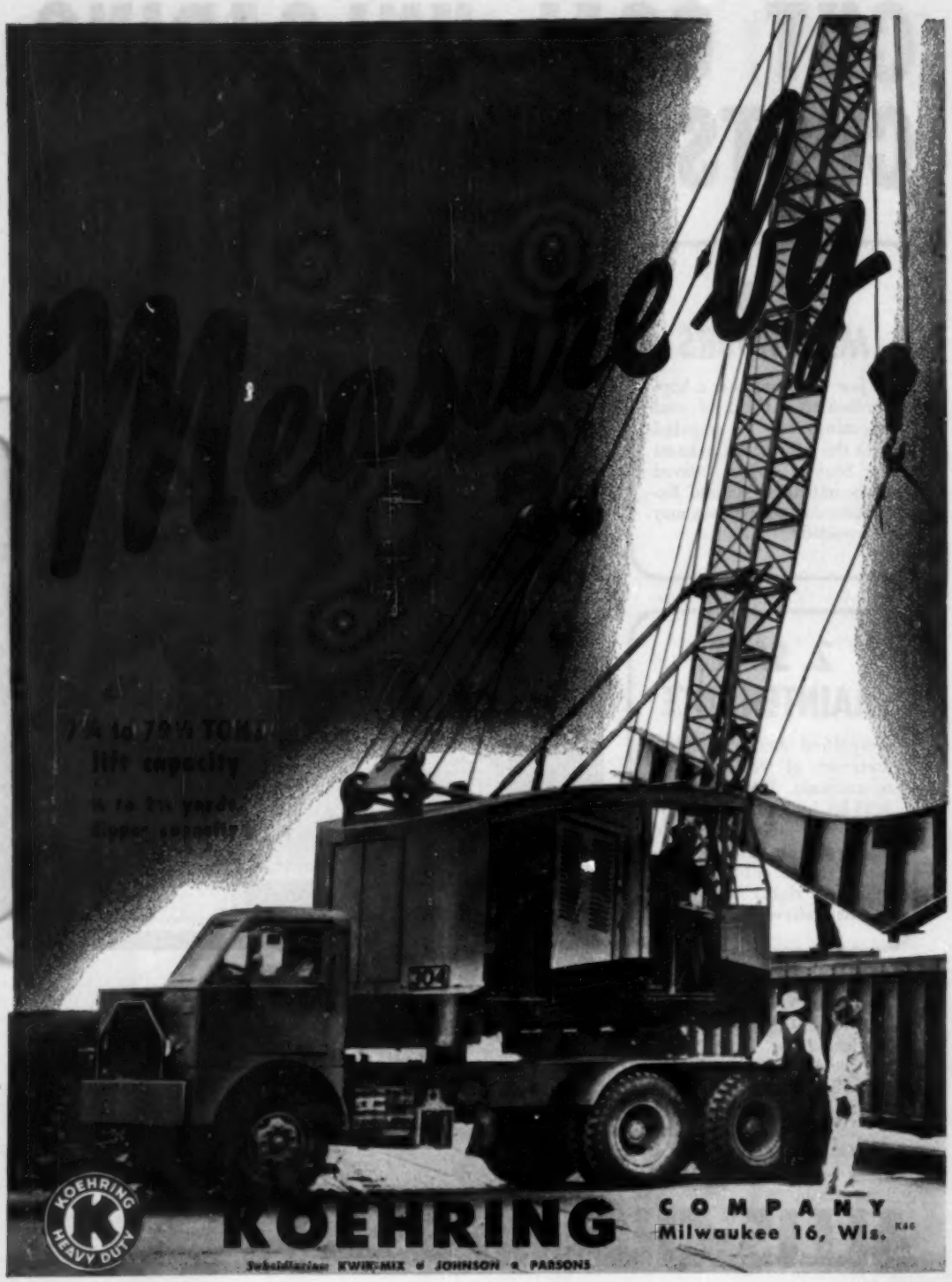
Please send Car Shaker Bulletin 07B7221.

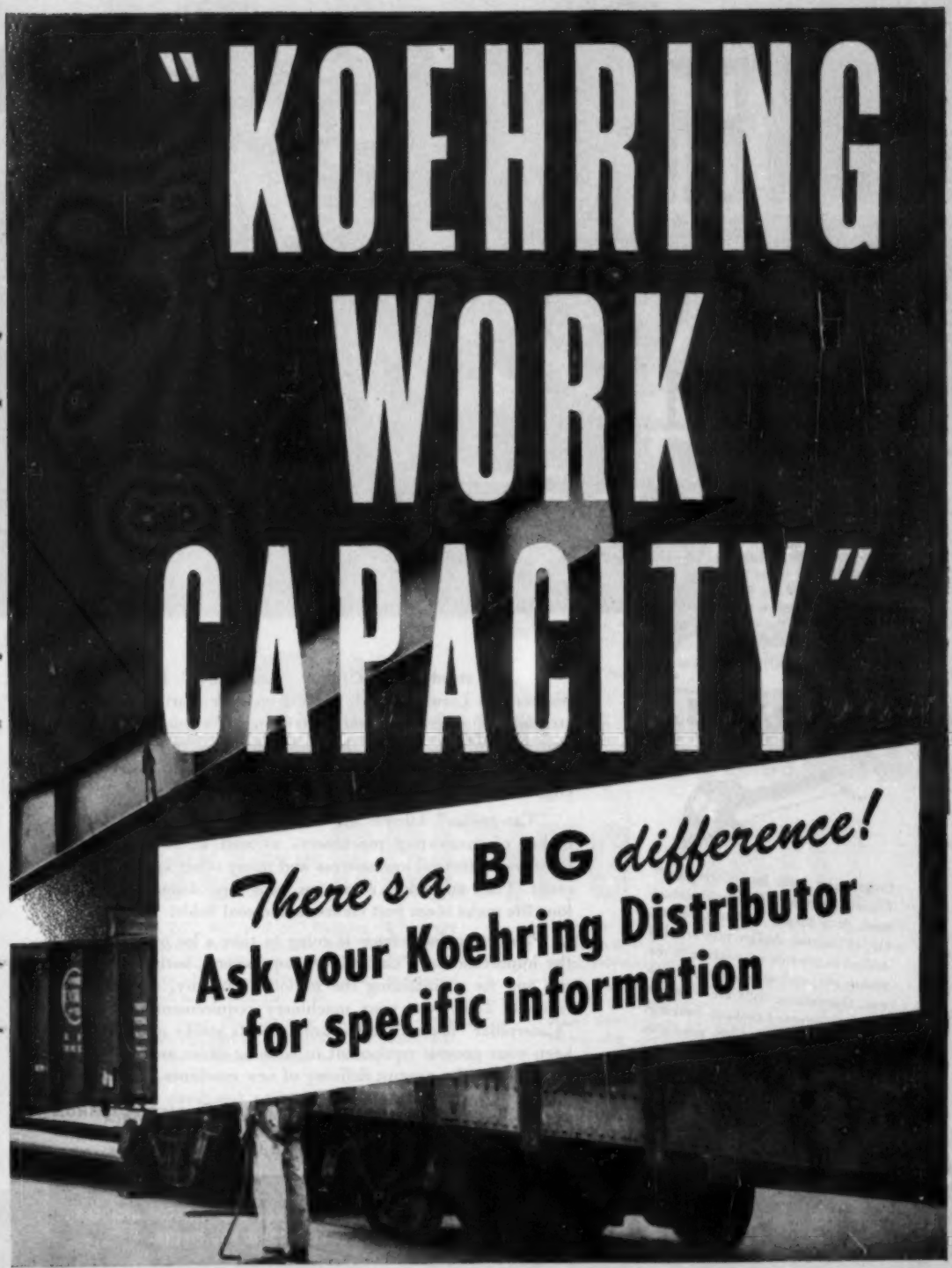
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Title_____

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Measure-Up
7½ to 75½ TONS
lift capacity
¼ to 3½ yards
dipper capacity
KOEHRING
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KOEHRING COMPANY
Milwaukee 16, Wis.
K46
Subsidiaries: KWIK-MIX • JOHNSON • PARSONS


"KOEHRING
WORK
CAPACITY"
There's a BIG difference!
Ask your Koehring Distributor
for specific information

POWER that digs coal fast



* In addition to the "Caterpillar"-powered Lorain Shovel shown in the foreground, Hart & Hart use a D8 and No. 85 Dozer to feed overburden to the dragline, and 3 DW10 Tractors to haul away earth.

LOOK UNDER THE HIDE



Connecting rods for "Caterpillar" Diesels are made of medium carbon steel, drop forged and heat treated. Of "H" section design, they are rifle drilled to provide oil passage to the piston pin, and to oil-cool the piston. Connecting rods are balanced to close limits. Crankpin bearings are solid aluminum alloy, precision type. Piston pin bushings are bronze and are precision bored. Look under the hide for built-in quality.

A steady-going D13000 "Caterpillar" Diesel Engine powers this Lorain Shovel, digging coal for Hart & Hart on a strip-mining operation near Providence, Kentucky. In a 4½-foot seam of No. 9 coal, the shovel works a 16-hour day and loads an average of 15 trucks an hour. The hour meter on the engine shows over 5,000 hours of satisfactory service.

"Caterpillar" Diesels are standard power in most leading makes of excavating machinery, as well as in compressors, crushers, industrial locomotives and many other kinds of equipment. Their rugged construction, economy, dependability and long life make them first choice in the coal fields.

Production for defense is going to take a lot of coal. Today the importance of "Caterpillar" equipment, both for military use and for maintaining the nation's economy, is greatly increased. Talk over your machinery requirements with your "Caterpillar" dealer. He has ample parts stocks and service to keep your present equipment in running order and will do his utmost to make prompt delivery of new machines.

CATERPILLAR, PEORIA, ILLINOIS

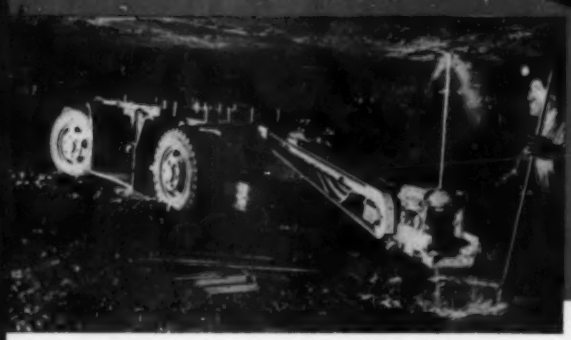
CATERPILLAR DIESEL ENGINES • TRACTORS • MOTOR GRADERS EARTHMOVING EQUIPMENT

ONE-MAN OPERATED . . . SELF-PROPELLED

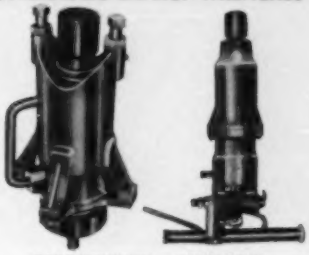
. . . AND WITHOUT AN EQUAL FOR FAST,

ECONOMICAL ROOF-BOLT DRILLING





HYDRAULIC IMPACT WRENCHES



DRILL-MOUNTED HAND-HELD

the JOY RBD-1 HYDRAULIC ROOF-BOLTING DRILL

★ Built in 26", 30" and 36" heights. Wherever rotary drills are applicable, the RBD-1 consistently out-drills other types—either pneumatic or electric—producing as many as *two-thirds more holes* per shift.

★ Bottoms your roof-bolting holes with only one steel change in practically all cases. Except in the thickest seams, *no other drill* will do this.

★ Rubber-tired and self-propelled—equipped with hydraulic controls for *one-man* operation. Employs boom feed, and is self-leveling and self-aligning while drilling.

★ May be equipped for wet drilling—or with vacuum dust remover, as desired—to eliminate objectionable dust.

★ Hydraulic impact wrenches are available, either drill-mounted, feed-leg mounted, or hand-held types. All types derive their power from the machine—have ample torque to drive nuts to refusal.

★ SULMET Carbide Bits and Drill Steels designed for the RBD-1 Drill are available.

Consult a Joy Engineer



W & D CL 3412

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

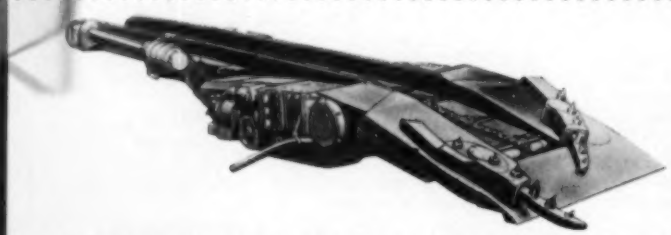
Another FIRST



Licensed under the patent to
E. C. Morgan, No. 1,953,325.

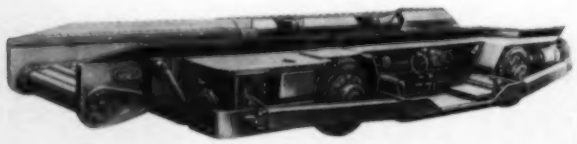
12-RB CUTTER

A rubber-tire mounted, mobile, fast-tramming cutting machine only 26" high, supplied either as a bottom or top cutter. For slabbing, the cutter bar swings 90° to either side. Bar tilt, roll, and lift are fully hydraulically controlled. Hydraulic steering provides extra flexibility for easy maneuvering. 50 HP cutter motor provides ample capacity to keep ahead of the loader; separate motor drives the hydraulic pump.



20-BU-1 LOADER

Overall height is only 24", yet this machine can load up to 8 tons per minute. Employs the exclusive JOY loading principle, also a new JOY development: the conveyor is driven independently of the gathering arm drive. This makes possible continued operation of the gathering head while a shuttle car is away, to provide a fully loaded conveyor for quick loading of the car when it returns. Also permits continued loading even when gathering arms are momentarily stalled with hard digging.



8-SC SHUTTLE CAR

Four-wheel positive drive, four-wheel hydraulic steering—with a new, wider, tapered-end design that permits minimum turning clearance. Only 26" high, yet with level capacity of 2 tons. Centrally located operator's station gives equal visibility in either direction. Separate motors for traction, conveyor drive, and hydraulic pump drive. Exclusive JOY disc-type brakes on all four wheels—hydraulic cable reel and hydraulically-adjustable elevating discharge.



A HIGH CAPACITY Team for Very Low Vein Coal

We're proud to announce one of the greatest forward steps since the original JOY pioneering achievements in mechanical mining. *Now, for the first time*—with the advent of the JOY 12-RB Cutter, 20-BU-1 Loader and 8-SC Shuttle Car—high capacity production has become a reality for mines operating in very low coal. Here are some of the advantages. (1) The timing problems and labor of conveyor moves are eliminated in favor of the great flexibility and economy of shuttle-car mining. (2) The high mobility of JOY trackless equipment permits high-speed mining both on advance and retreat. (3) In case of a squeeze, only a few minutes are required to move all equipment from the section. ● *Call on us for any data you need.*

For thin or thick seams, whatever your operating conditions may be, JOY builds a complete, field-proved line of modern mining equipment to increase your tonnage and reduce your costs.

Consult a Joy Engineer



AD CL 3410

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

NEW... LOW HEIGHT LIGHT WEIGHT



JOY

BUREAU OF MINES – Approved
PERMISSIBLE-TYPE

SAFETY CIRCUIT CENTER

for Thin Seam Mines

Only 15½" high and 19¾" wide for maximum compactness and portability in thin seams . . . this new 3-outlet Safety Circuit Center provides all the superior protective features found in larger JOY permissible units for the safe distribution of power to drills, cutters, loaders, conveyors, etc. in gassy mines. Protects men, machines and cable . . . is completely aluminum-housed . . . has aluminum skids . . . and can be transported on narrow belts. In the permissible style, the unit can be equipped with or without safety ground trip. Current ratings to meet your needs.



WITH PILOT PIN TYPE SPB CONNECTORS

Threaded metal couplings prevent accidental disconnects and insure watertight connections. Larger sizes revolve on ball bearings.

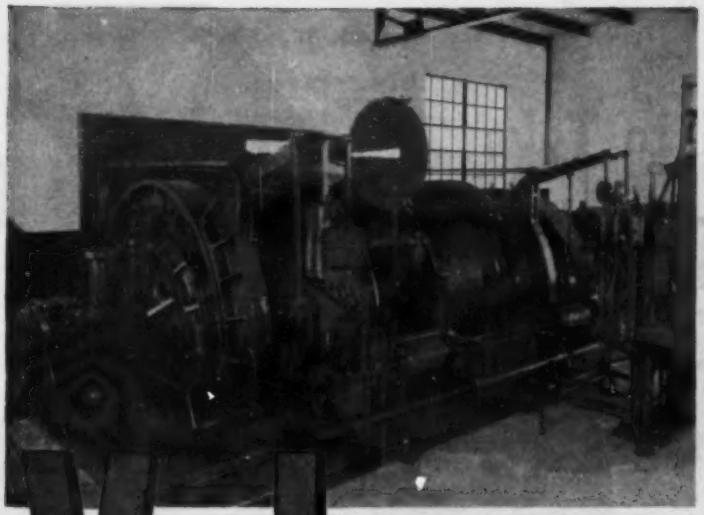
Consult a Joy Engineer **for complete details and prices**

WHO ME 3548

MINES EQUIPMENT MINES *Division*

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.



22 Years of Trouble-Free Service And Still Going Strong

Installed at a well-known mining operation in 1928, this 900 hp. double-drum hoist has not only given "Very Satisfactory Service" for more than 22 years but is still, apparently, as good as ever. The cylindrical drums are 9' in diameter by 4'-10" face, grooved for 1⅛" rope. One drum is provided with a positive tooth-type clutch for safe hoisting from different levels, and both drums have parallel-motion post-type brakes. Brake and Clutch engines are air-operated. Vulcan Safety Devices provide dependable protection against any damage that might otherwise be caused by current failure, over-speeding, over-winding or starting in the wrong direction.

Vulcan HOISTS and SHEAVES Are ALWAYS Dependable

For more than a hundred years the Vulcan Iron Works has been building good mine hoists—taking such full advantage of every proved advance in design, materials and accessory equipment that Vulcan Hoists, today, are unsurpassed from every standpoint of Speed, Safety and Operating Convenience. The hoist illustrated and described above embodies only one of the many Vulcan designs that have proved their dependability through long years of trouble-free service and new designs are constantly being developed to meet specific operating conditions.

Correspondence regarding any mine hoisting requirement, no matter how large or how small, is cordially invited. Our experienced engineers welcome opportunities to make money-saving suggestions, whenever possible, without charge or obligation. Ask, also, for Bulletin A-409; its 32 fully-illustrated pages are packed with information regarding all types and sizes of Vulcan Hoists.



Illustration above shows a Vulcan ALLCASTEEL sheave mounted on self-aligning roller-bearing pillow blocks. Another popular type has tapered roller bearings in the hub and revolves around a dead shaft held in steel clamp-type pedestals. Besides being light and very strong, Vulcan ALLCASTEEL sheaves are so highly resistant to rope wear that NO LINERS ARE NEEDED. Available in a wide range of types and sizes with either plain or anti-friction bearings.

VULCAN IRON WORKS • WILKES-BARRE, PA. U. S. A.

Heavy-Duty Electric Hoists	Shaking-Chute Conveyors	Steam Locomotives	Load-Carrying Larries
Self-Contained Hoists	Chain Conveyors	Diesel Locomotives	Rotary Kilns, Coolers and Dryers
Scraper Hoists	Cast-Steel Sheaves and Gears	geared and electric drive	Briquetting Machines
Car-Spotting Hoists	Cages, Skips and Gunboats	Gasoline Locomotives	Heavy Special Machinery
Boom Hoists	Toothed Double-Roll Crushers	geared and electric drive	Open-Hearth Steel Castings

Constructed to Take Severe Punishment

Without Tube Swelling



Tube Securely Locked by Special Stainless Steel Inner Wire Braid!

Illustration above shows how exclusive inner stainless steel braid of CONCORD #20 Steam Hose prevents tube swelling and assures long life under severe use.

CONCORD #20 STEAM HOSE

Here's the steam hose with a structural difference that eliminates . . . once and for all . . . the common failure of tube swelling under continuous high pressure operation.

CONCORD #20 Steam Hose gives you the exclusive protection of a tough inner lining . . . a lining of stainless steel wire braid. This braid assures permanent retention of the original inside hose diameter. It prevents swelling and constriction of the tube . . . assures full flow of steam at all times . . . permits re-coupling in the field when necessary, without the slightest difficulty.

In addition, CONCORD #20 construction features include: two or three braids (depending on size) of alternate high tensile steel wire and rubber layers are firmly bonded over the outside of the tube. They provide maximum burst-protection and safety. An asbestos braid provides positive cover adhesion and serves as cover insulator. On top of all is the rugged, abrasion-resistant cover that withstands the severest abuse.

Flexible, tough and dependable . . . that's BWH's new CONCORD #20! Ask your nearby BWH distributor for a demonstration. Get in touch with him today, or write us direct.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

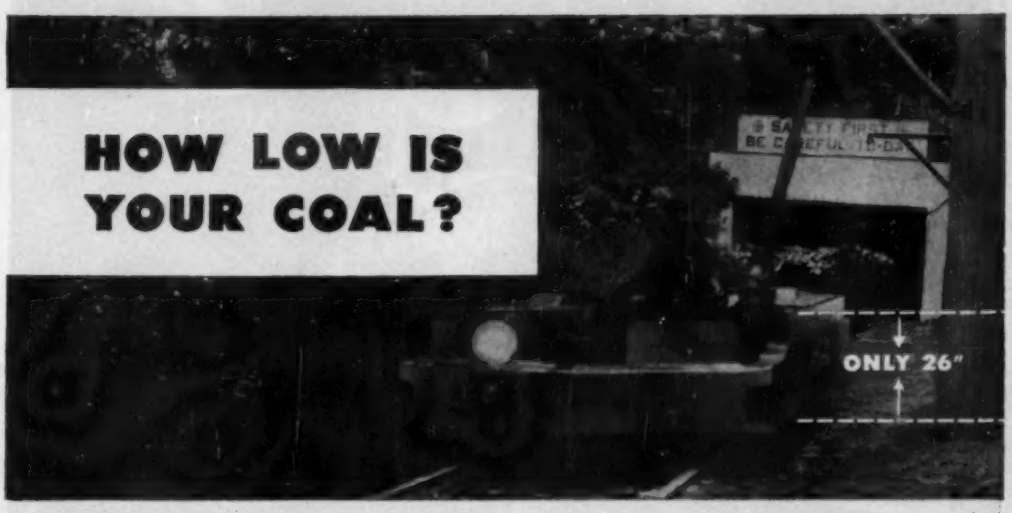
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BWH DEPENDABLE RUGGEDNESS

YOU CAN BE **SURE**.. IF IT'S
Westinghouse

HOW LOW IS YOUR COAL?



Get More Low Coal Per Man-Hour With the 15-Ton Low-Liner

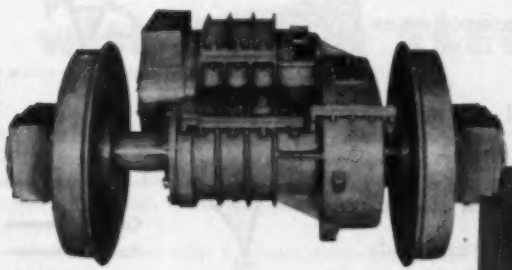
Speed high-tonnage output from low veins with the 15-ton "Main Haulage" LOW-LINER. Only 26" high, it goes in veins inaccessible to conventional heavy-duty locomotives—reduces unproductive "clearance" excavation. Powered by two 90-hp motors, it hauls loads up to 9 mph at 7,500 lbs. drawbar pull . . . can be operated in tandem for greater capacity. Motors have high continuous rating. Electropneumatic control simplifies handling.

Flush-frame construction increases safety and provides ample equipment space. The flat top affords greater visibility, better clearance to the top of the mine. All parts are arranged for easy access. The Low-Liner also embodies many other design features which contribute to reliable performance and economical haulage.

CHECK THESE DIMENSIONS:

Height	26"	Gauge	44"
Width	78½"	Wheel Base	85"
Length	21' 2"	Wheel Diameter	24"

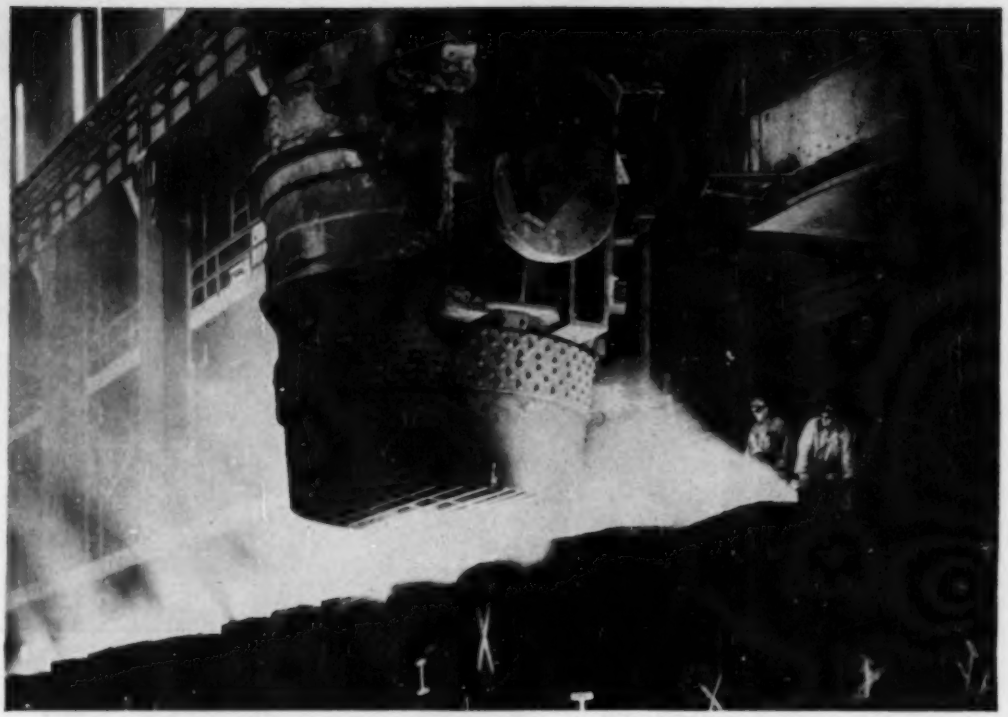
For full details, call your Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-15139



What Makes the Low-Liner Low

Small-diameter motors with parallel spur gearing mounted in a common casting—plus smaller wheels —cuts over-all height to a *26" low.*

Westinghouse
MINE LOCOMOTIVES



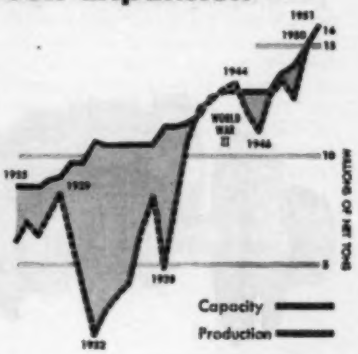
MILLION TONS MORE STEEL

Latest Increase in Bethlehem's Annual Capacity Climaxes 5 Years of Postwar 3,100,000-Ton Expansion

On January 1 of this year Bethlehem's steel making capacity stood at 16 million ingot-tons annually—*an increase of 1 million tons* over a year ago.

Since the war ended we have increased our annual steelmaking capacity *3,100,000 tons, or 24 per cent.*

Moreover, as the chart at the right shows, Bethlehem's steel capacity has nearly doubled in 25 years. Additional capacity can and will be created as it is needed.



BETHLEHEM STEEL ★ BETHLEHEM STEEL ★

low costs ahead





with P&H ELECTRIC SHOVELS

Better shovels mean better production in every way. And here's another team of P&H Electrics that are proving it. They're faster, of course. P&H Magnetorque* Hoist gives you smoother, livelier dipper action with electro-magnetic power. There's no friction, no wear.

You'll find some other important differences in P&H design . . . including the husky all-welded construction that gives you greater strength to withstand shock loads—and the increased electrical efficiency that gives kilowatts a new incentive. They all add up to the steady, dependable operation that lets you maintain schedules and cut tonnage costs for years to come.

On a major investment of this kind, you should *know* how much more P&H Electric Shovels give you. Ask for the facts. Write today!

*Trade-mark of Harnischfeger Corporation for electro-magnetic type clutch.

Here's another team of P&H Electric Shovels at work on the Mesabi Range. They're owned by a prominent mining company at Virginia, Minnesota. At left is a P&H Model 1400 (4 cu. yds.). At right is a new P&H Model 1055 Electric Shovel (3 cu. yds.) which incorporates all of the famous P&H features.

P&H ELECTRIC SHOVELS
4540 W. National Ave.
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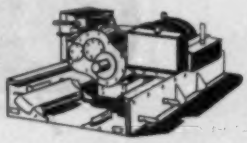
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Molded in Lead

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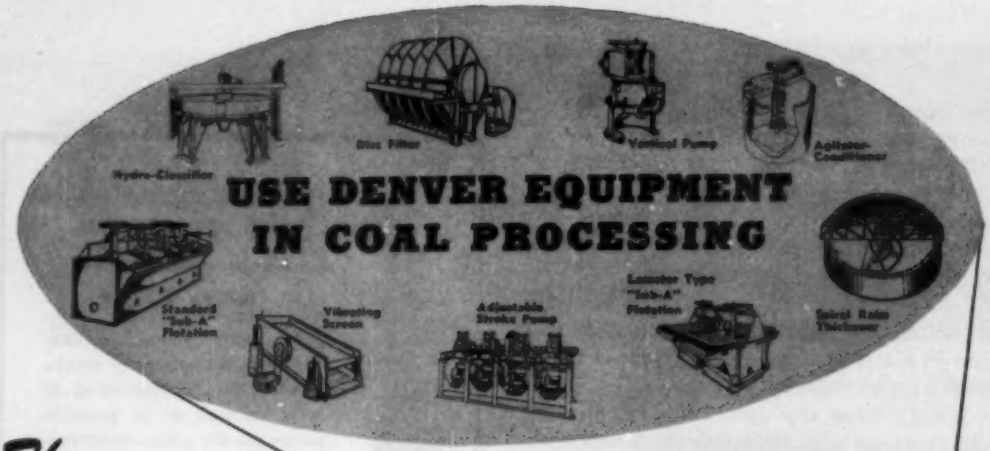
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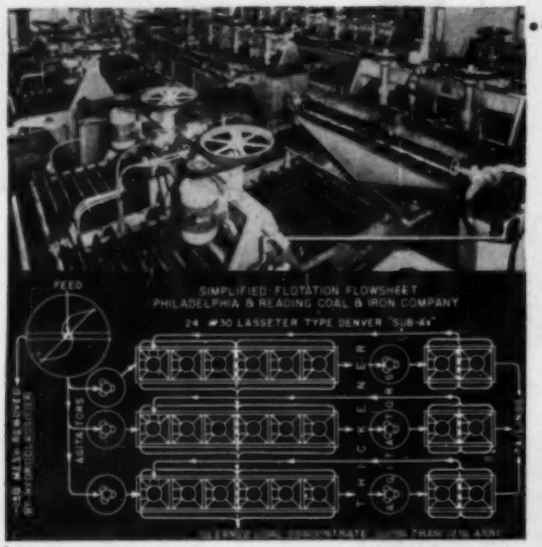
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Particle Size: Minus 10 mesh to plus 200 mesh.

Tonnage: 150 TPH initial feed.

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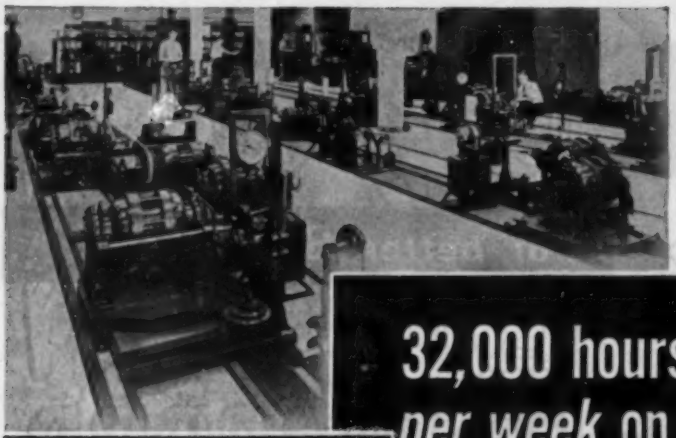
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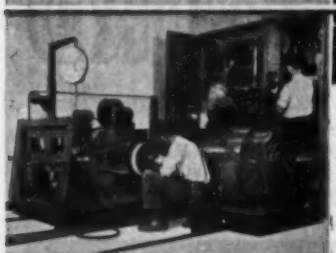
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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

JANUARY, 1951

IVAN A. GIVEN, EDITOR

Production and Leadership

"ON THE FOREIGN FRONT, the United States fought in World War II to achieve the basis for a lasting peace. It had a real opportunity to achieve and maintain a position that would enable it to work effectively toward that goal. What is the picture now? The present administration failed miserably in capitalizing on its opportunity with the result that today our effectiveness has been largely dissipated and we find ourselves in a difficult if not actually perilous situation."

Though published on this page in October, 1948—nearly 2½ years ago—a hard look at the present situation leads to the conclusion that the preceding statement is more true than not, even yet. The fact is that we are at war with the Communists—whatever their national labels and wherever they are—and have been one way or another since before the end of hostilities in World War II. Perhaps the conflict will end soon, but more likely it will be concluded only after a lengthy and all-out effort. But, though belatedly and haltingly, we are beginning to move, and can be confident that when we bring our full efforts to bear—under effective leadership—victory will be ours.

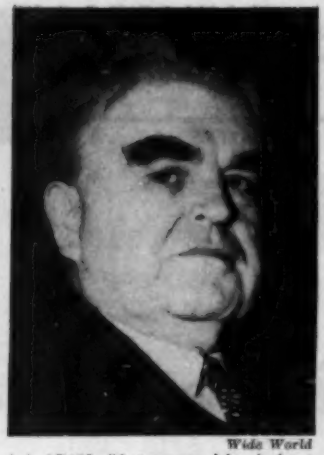
All-out effort for a long period of time—nothing less seems safe to count on for the time being—means a radical change in normal personal and business habits. This we already know from the last war, and the prospects are that the present conflict will require even more from manpower, and from manufacturing, mining and service facilities. At the same time, we go into it with practically no labor surplus and with most of our production facilities—coal being one exception—running at full capacity. When the pinch comes, it may well be far more severe than anything we have ever experienced before. In fact, the Nation's industrial machine must perform miracles of efficient production with a minimum of manpower if the demands of anything like a major conflict extending over an appreciable time are to be met. Even organization and maintenance of a relatively modest military establishment as a preparedness measure, assuming an immediate end of overt action, means a considerable extra burden on the economy.

Coal, as previously noted, is one of the exceptions at the present time as far as full operation is concerned. All other things being equal, therefore, it can easily meet a major increase in demand for its product. Whether 1951 will require stepping up to maximum capacity still is speculative, since it depends upon what the Nation's needs will be for military purposes. However, if no more than the present production level is required, with due allowance for the normal summer recession, bituminous output in 1951 could easily exceed 535 to 540 million tons. Some look for a much-higher total. At the same time, the groundwork is being laid for a further increase in anthracite tonnage, particularly if normal temperatures prevail during the coming year.

It becomes increasingly clear, therefore, that coal once again must prepare for a high level of production—perhaps at maximum rates fairly soon and for a long period of time. At the same time, it will have to prepare to produce with a minimum of manpower and materials. Thus, efficiency becomes even-more important, along with total volume of output. At same time, coal men, along with all other citizens, have the responsibility of developing and supporting effective national leadership so that, combined with full production, it can achieve victory at the earliest-possible date.



ROBERT H. SHERWOOD—"Our own companies are making long-range plans for a future of about 20 yr."



Wide World

J. L. LEWIS—"Just suppose labor had not won! Could McGraw-Hill have uttered . . . optimistic predictions?



JAMES PRENDERGAST—"How energy requirements are . . . divided . . . will depend on relative prices of . . . fuels."

The Executives' Forum

Planning 10 Years Ahead

The Nation's Growth Potential Looks Like This:

More Customers — Higher Productivity

Better Living Standards — Bigger National Income

Against This Background, Six Coal-Company Presidents and Mr. Lewis Scan Coal's Outlook and Answer Three Questions:

1. How Does Coal's Future Look to You?
2. Is Present Industry-Wide Planning Adequate?
3. Is Your Own Company Making Long-Range Plans?

HOW MUCH can industry and business grow in the next 10 years?

What's the outlook for coal?

The growth potential for industry and business—not how much they *will* grow but how much they *can* grow—is big, very big. That's the conclusion McGraw-Hill economists came to in a study they recently completed on the nation's economy.

Briefly, they see the possibility of achieving the following growth by 1960 (dollars are 1950 pre-Korea dollars and do not reflect the very real possibility of inflation in the decade ahead):

Total national output: $315,000,000,000 of goods and services. That's 18% above 1950.

Population: 165,000,000; up 9%.

Employment: 65,500,000; up 5,000,000.

Business-capital expenditures: Close to $25,000,000,000; up $4,000,000,000.

Consumer expenditures: Over $220,000,000,000, compared to about $185,000,000,000 seen for 1950.

The two main reasons why McGraw-Hill economists believe this great growth is possible are:

1. Increases in population.
2. Higher standards of living.

The factor that can bring about this growth is higher productivity growing out of increasing substitution of machines for men and, therefore, more uses of energy per person.

The *ifs* are few. The big ones are:



FOR COAL AND OTHER INDUSTRIES, population growth and rising standards of living will bring big opportunities for expansion. To grasp these opportunities and make the most of them, coal will need vision, courage and strong leadership.

1. A shooting war with Russia.
2. The political and social climate in this country, which can help or hinder growth.
3. The ability of business men and industrialists to envision the opportunities ahead and build the plants, machines and facilities to provide enough goods and services.

On these *ifs* and others, McGraw-Hill economists are optimistic—in a conservative way.

Will coal grow along with other industries?

Narrowing the focus down to specific industries, our economists reported as follows on potentials in the fuel industries:

"The biggest foreseeable growth is in the use of natural gas for home heating and for industrial purposes. The NSRB estimates that sales of natural gas will increase 20% from 1949 to 1952. Hugh Cuthrell, president, American Gas Association, has forecast that sales will double or triple within a decade.

"This expansion will increase the share of fuel needs filled by gas at the expense of coal and fuel oil. But the nation will require increased amounts of all three fuels to support its growth. Our total use of energy—for heat, light, power and transportation—is expected to rise more than 20% by 1960. Increased electric-power output, for example, will call for substantially greater quantities of coal; more motor vehicles, for higher production of gasoline.

"Fortunately, coal, oil and natural gas all will be available in adequate quantities. In fact, an abundance of fuel, at relatively low prices, is one of the favorable items in the outlook for chemical processing and for electric-power generation. The American Petroleum Institute has estimated that considerably more fuel oil and natural gas will be available for consumption in the '50s than in the '40s. New discoveries are making up for increased use and adding to our known reserves in the ground."

Thus for coal, as well as other fuels, the outlook for the 10 yr is good. But competition will be strong.

In the belief that competition, such as coal has experienced in the past and will experience in the future, should spur rather than deter long-range planning, *Coal Age* sent copies of the McGraw-Hill economics study to a few top coal executives and to John L. Lewis. We asked their comments on the study and for their answers to the following questions:

1. How does coal's future look to you against the background of the McGraw-Hill figures?

2. In your opinion, is coal's industry-wide planning, as shown in the work of its associations and research organizations, adequate for coal's potentials?

3. Is your own company making any long-range plans? Are you and your associates think about the position of your company 5 yr hence? Ten years hence?

Here are seven letters *Coal Age* received in answer:

What Coal Leaders Think About the Next 10 Years

R. H. Sherwood

PRESIDENT, CENTRAL INDIANA COAL CO. INDIANAPOLIS, IND.

"This is a belated answer to your letter of August 22. I will try to make it short, as I know that is what you prefer. Here are my answers to your three questions:

"1. Coal's future should not be looked at in comparison with the hectic background of the last 8 yr. Compared with other industries, producers of bituminous coal have much in their favor. They have an assured market, they have no hazard as to losses on inventory, and they have no immediate problems as to the cost or availability of their raw materials. Their bookkeeping is simple—they can always tell exactly where they stand financially.

"I believe that the coal industry learned a lesson during the depression years, because during the present highly competitive market there has not been the senseless price-cutting that we had in the '30s. We should be thankful for this condition.

"All that I think coal producers should ask is to be allowed to operate their mines efficiently and without interruption. In return for noninterference by labor with efficient management, I think our industry should be and I think will be willing at all times to pay wages commensurate in amount with those paid in other industries for like skills and types of work. No outsider can help us in this major problem. Therefore, I say we should be let alone to work out our own salvation and be thankful for the advantages we have and which I have enumerated above.

"2. Industry-wide planning as it affects market conditions or production is not practicable. This is due to the wide variety of coal seams of different rank, and complex marketing conditions. However, the consolidation of more mines under one management is helpful in the orderly development of mining property.

What The Executives' Forum Is and How It Works

A NEW DEPARTMENT—This month "The Executives' Forum" makes its first bow as a *Coal Age* department. The topic for debate in this issue, as seen above, is the size of coal's potential for growth and whether it's worth while for a coal company to make long-range plans. Six industry leaders and Mr. Lewis wrestle with these questions. We believe you'll find that their various opinions make interesting reading.

In other issues of *Coal Age* to come, the topic for debate will be different. Thus "The Executives' Forum" will be a place where coal company executives may argue issues, express their views on the industry's problems and report on spot conditions in their own areas. Sometimes, when the editors think an outsider might be helpful in the debate, we'll ring one in to tell what he thinks. But mostly, The Executives' Forum will be by and for coal men.

IT DEPENDS ON YOU—As far as issues and problems are concerned, coal always has a hatful of them and it won't be hard to keep "The Executives' Forum" in business. To mention only a few, they include the railroad-car supply, the defense program and the draft, the availability of steel, the progress of industry-wide research and public relations, and the merits of incentive bonuses to spur production.

The issues and problems, to repeat, are at hand or will develop as time goes on. *Coal Age* will provide the place for discussion, opinion and suggested solutions.

From there on, it's up to you. If you have a question or a problem that you feel needs an airing, tell us what it is. If we ask you for comment, let's have your ideas. The goal is a better industry and a better future for you through collective effort toward solving the problems of the day.

"We are sadly lacking in the scope of our research. This is because the industry, as a whole, is unwilling to give general research substantial support. I hope and believe that under the direction of Dr. A. A. Potter, the newly elected president of BCR, the support of this important phase of our industry will be largely increased.

"3. Our own companies are making long-range plans for a future of about 20 yr. Beyond that the horizon becomes so hazy as to make planning impossible. I would hesitate to purchase coal reserves that I knew I could not at least start to mine within the next 20 yr. It is my feeling that some other source of power may have substantially replaced coal by that time.

"In conclusion, I want to say that I think the McGraw-Hill Co.'s speculation as to what will be in the future is very thought-provoking and interesting and that the McGraw-Hill Co. is to be congratulated on what it has done."

H. B. Crandell

PRESIDENT, CLAYTON COAL CO. DENVER, COLO.

"I want to thank you kindly for sending me a copy of 'The Next Ten Years.' . . .

"I think it is a very worthwhile subject. We hope the forecast comes true, but I can't agree with it. It's too much like a Keyserling report, with not enough allowance made for misfortunes and changed conditions both in the national situation and the international situation.

"You know the misfortunes that happen to humanity are those that are usually unforeseen and slip up on our blind side. It would take too long to write out all the dark side of the picture and undoubtedly there are others more capable than I to look forward and see all the pitfalls this country may fall into and it is surely depressing to let one's imagination run riot."

John L. Lewis

PRESIDENT, UNITED MINE WORKERS OF AMERICA, WASHINGTON, D. C.

"I have read the survey entitled 'What Can Happen in the Next Ten Years,' which you sent me with your letter of August 22 with request for comment.

"The survey seems to be rather a combination of speculative information gathered from research directors in various industries, and recent pamphlets from several foundations which have attempted to correlate research and public demand for goods and services. It projects the increased purchasing power of the people and the increased production necessary in both soft and hard goods to meet the continuing increased demand of population growth and improved standards of living.

"I appreciate the survey may have some value. Perhaps it is especially valuable as respecting advertising, promotion and editorial guidance for McGraw-Hill publications. I am disappointed, however, that nowhere in the survey can I find an appraisal of or credit given to the fundamental economic factors that made possible the survey's optimistic prophecies of bigger and better business during the next decade.

"Inescapably, it was organized labor's pressure for the shortening of working days and increasing wages which in turn forced producers to mechanize factories and mines and employ engineering and management intelligence to produce more and more products that the market could absorb because of the higher wages.

"Your survey failed to give recognition all along the line to organized labor for the enactment of workmen's compensation laws, public old-age benefits, aid to widows and children, old-age pensions, unemployment benefits and the present social-security laws that the 81st Congress only recently amended to provide for increased benefits.

"All in all, the economic benefits to the national economy and the body social and politic, which have created sustained income and purchasing power, constitute the program that has to a large degree decreased the high peaks of unemployment, poverty and perpetual pauperization which beset the Nation prior to the sharp expansion of the numerical strength of organized labor and the increase of its influence on the national economy during the past 20 yr.

"Obviously, . . . you would not be able to predict the possibility of a prosperous decade between 1950

and 1960 that the survey indicates if the labor-relationship policies championed by McGraw-Hill publications and the advertisements in the national press under the signature of Mr. James H. McGraw, Jr., had been accepted by the Nation. The policy advocated by McGraw-Hill—which called first for resistance to unions, secondly for liquidation of unions and support for the passage of the NAM Taft-Hartley Law and every other conceivable measure to hobble workers and hamstring their organizational devices—certainly would not have enabled the workers to become likely consumers of the 'better things for better living.'

"Just suppose that labor had not won!

"Could McGraw-Hill have uttered the optimistic predictions set forth in your analysis?

"In similar fashion, you forgot to chronicle the work of organized unions in seeking abolition of child labor, which in turn gives every youth an educational opportunity to possess fuller knowledge and greater development of his intelligence, thus enabling him to become more proficient in his contribution to the work of the Nation. The work of the unions in eliminating sweat-shop conditions has been a most magnificent contribution to the welfare and prosperity of the legitimate units of business, which are entitled to fair play in the areas of national competition.

"I trust that you will forgive the candor which prompts these few observations. You were good enough to ask my opinion, and I would consider it futile to say less than I think."

James Prendergast

PRESIDENT, SUSQUEHANNA COLLIERIES DIVISION, THE M. A. HANNA CO.
CLEVELAND, OHIO

"Right off the bat I must state I am no seer and, consequently, cannot quarrel with your figures, so the figures in your estimates are taken for granted.

"As to how the energy requirements are to be divided as to coal, oil and natural gas over the next decade, this will depend on the relative prices of the respective fuels. At the present time, natural gas is replacing both coal and oil quite generally in the United States and Canada largely by reason of its price. Coal and oil, on the other hand, are staging a ding-dong battle with the swing at the moment to coal by reason of recent price increases in fuel oil. There are many factors which could change the price balance between these respective fuels over the next 2 or 3 yr, let alone the 10-yr period.

"Our own assumption is that coal has a certain place in the energy picture, and our expenditures for new plants have been predicated on that basis."

An Ohio Operator

(NAME OMITTED BY REQUEST)

"I have read it [i.e., the McGraw-Hill economics report] very carefully and heartily concur with the contents.

"I am pleased to answer the questions you asked. . . .

"Question 1—I do not think that the future of the coal industry for the next 10 yr is nearly as bright as that of most industries in general.

"Question 2—No, I do not think [coal's industry-wide planning, as shown in the work of its associations and research organizations, is adequate for coal's potential]. The work for the coal associations and research organizations is most commendable but the difficulties in our industry are the result, in my opinion, of: (1) the inroads of gas and oil on the markets coal formerly held, (2) labor relations and (3) railroad transportation.

"I personally feel that gas has become at the present time the No. 1 source of fuel energy; oil, No. 2; and coal, third. . . .

"Question 3—Yes, my associates and I are attempting to make long-range plans and we are very definitely thinking of the position of our company 5 yr hence and 10 yr hence. I think it is the duty of every coal company with the questionable future before us to take stock of themselves, to see whether or not they are able to continue in this business and to do everything in their power to improve themselves in their industry.

"One thing that has been overlooked, in my opinion, is maintaining and increasing company goodwill. There must definitely be plans made to finance continued mechanization, as mechanization is, in my opinion, only beginning and equipment will become obsolete and must be depreciated much quicker as new types of mechanization occur.

"A coal company that does not have goodwill, good properties and good preparation, as well as vision and imagination, has, in my opinion, a dark future for the next 10 or more years."

C. M. Dodson

PRESIDENT, LOCUST COAL CO.
BETHLEHEM, PA.

"In attempting to answer your three questions, I, of course, feel qualified to comment only on the anthracite phase of the coal business. My extemporaneous answers, therefore, are:

"Question 1—We look for a mild increase in anthracite tonnage over the coming years, provided aggressive merchandising policies are followed by the industry as a whole. However, the 'mild' increase is not to be construed as meaning that we feel anthracite will gain in comparison with the business outlook as shown by the McGraw-Hill report.

"Question 2—We do not think industry-wide planning is as extensive as is warranted by coal's potential, but we do think it is as extensive as can be properly financed under existing conditions.

"Question 3—This problem is receiving constant attention by this company."

A Tennessee Operator

(NAME OMITTED BY REQUEST)

"I wish I could agree with you on some of the 'great growth possibilities.' I see a great deal of gloom, as far as the coal business is concerned, and while war might help us, I dislike thoroughly to think we are depending on the life and death of our young people to make us a little money.

"When we started our construction work about 5 yr ago [we were] at a point where we had to go forward or backward. We could not stand still. We were working out mines and soon would have become an unimportant factor in the bituminous coal industry.

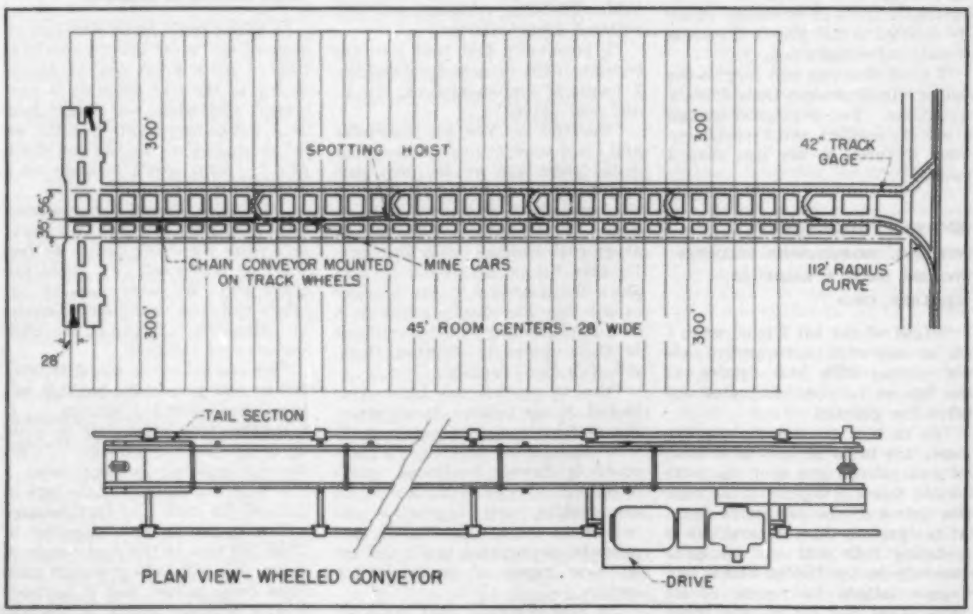
"We started out to spend $6,000,000 on new properties, but this has been extended to $12,500,000. . . . It will take us another year to build up to our planned tonnage. . . . We are not pushing [output from a new mine] on account of the lack of demand for coal. . . . Our tonnage will now get up to a capacity of 7,000,000 tons in the next couple of years. We will have premium coals from fresh mines, and if anybody is able to make money in the coal business, certainly we should, and should be in the top 10."



WHEELS UNDER EACH SECTION, plus long bolts to permit joints to open up, permit moving gathering conveyor without dismantling.

Efficient Mining in Low Coal Facilitated by . . .

Gathering Conveyors on Wheels



POSITION OF THE WHEEL-MOUNTED CONVEYOR when room work in a panel starts is shown at the top, while the bottom view shows how the conveyor is offset on the axles so that the drive sections will balance.



MINE CARS MOVED AROUND A CIRCLE TRACK by a spotting hoist receive coal from the gathering conveyor on wheels.

- **GOAL**—Moving Gathering Units Without Dismantling
- **METHOD**—Wheel Mounting and Long Bolts at Joints
- **APPLICATION**—Thin Coal Under Very-Bad Top

THREE SECTIONS in the mines of the Inland Steel Co., Wheelwright, Ky., are operated with chain-type gathering conveyors mounted on track wheels. Thus equipped, a conveyor can be moved to the next loading point in a few minutes between shifts and transported to another panel almost as easily as pulling a string of mine cars. This innovation was suggested by E. R. Price, manager of coal properties. The first of the conveyors was fitted with wheels and axles in the Wheelwright shop, while the last two were equipped with wheels and axles at the factory. All three are Jeffrey Type 61WH.

Two mobile conveyors are working at Price mine in the Elkhorn seam, where the clean coal is approximately 34 in. The shale or slate roof is very bad. It includes a 10-in rider seam which, in some places, is only a few inches above the clean coal. However, the distance above the seam ranges up to 5 ft. To reach good top, which consists of a firm slate, about 63 in of waste material must be taken down.

● **Why the Wheeled Conveyor Was Chosen**—Ordinary posting, as a rule, will hold the top long enough to complete a room. Present-day practice in the coal-mining industry pointed to the installation of belt conveyors in 2,000-ft panels, thus avoiding the taking of top on the panel entry. Compared to a tracked entry, however, that step, in the opinion of the management, would have introduced the usual difficulties in supplying materials, would have increased travel time and would have made the mine a less desirable place to work in because of the lower height on the room entries.

The alternative plan consists of driving a triple-heading entry, taking top in two of the headings, equipping both with track, and installing a circle-haulage point opposite every sixth room; that is, every 270 ft. The loaded track in the center heading turns off the main on a 112-ft-radius curve, which the wheel-mounted conveyor negotiates when being pulled into and out of the panel.

● **Mining and Haulage**—Mining of the panel is on the retreat, and the rooms are driven 28 ft wide on 45-ft centers. Rooms are worked on both sides of the entries and the equipment for each side consists of one Jeffrey 35L cutting machine with Joy T truck, one Joy 14 BU loader and one Joy 6 SC cable-reel shuttle car 29 in high.

The shuttle cars dump directly—at right angles—into the wheel-mounted gathering conveyor, which is 360 ft long and serves for mining 12 rooms—six on each side—before being moved to the next position. After the 12 rooms have been completed and the next two on each side have been started, the conveyor is pulled 270 ft outby to the next car-loading point. The actual move over that distance requires less than 25 min or one-fourth the time it would take to dismantle 270 ft of belt conveyor.

● **Joints Open on Curves**—The chain conveyors are built with standard 6-ft sections, and each section has an axle welded to the bottom of the pan at a point 12 in from one end. Bolts holding the sections together must be longer than normal to permit the joints on one side of the conveyor to open when it is pulled around a curve. The bolts on the one side are loosened to provide 1 in of opening, while those on the other are loosened only one complete turn.

Track gage is 42 in and, as indicated in the accompanying drawing, the conveyor is offset to one side of the center of the track so that the drive unit will be properly balanced on the wheels.

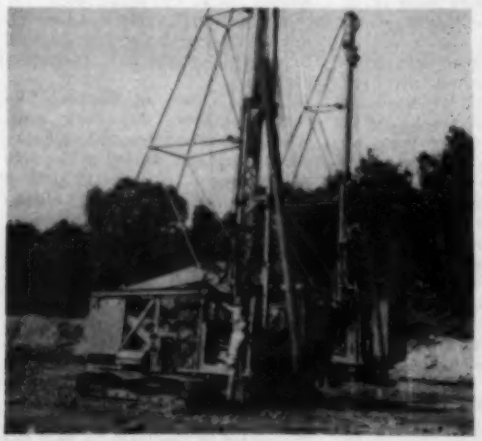


PARALLEL-TANDEM STRIPPING at Chieftain No. 20. Dragline in the rear with boom in low position benches off and removes the front of the bank. Shovel in front finishes the cut, tossing off with hard material to the edge of the coal.

The Chieftain 20 Story—1

- **Parallel-Tandem Stripping in Deep Overburden With Shovel and Two-Position-Boom Dragline**
- **Casing Overburden Holes, Drilling Coal With Tractor-Mounted Unit and Torque-Converter Haulage**

AFTER 16 YEARS of shovel stripping and 2 yr of dragline stripping, operations at Chieftain No. 20 mine of the Maumee Collieries Co., at Riley, Ind., entered a new phase Oct. 1, 1950: parallel-tandem operation using the original electric shovel and a new 25-cu yd walking





CASING TO PREVENT HOLE COLLAPSE is necessary in drilling through a gravelly clay at Chieftain No. 20. Here, a casing has just been pulled by a drill. At the right are two of the powder wagons employed at No. 20.



SPOILING IN PARALLEL-TANDEM OPERATION, with dragline on bench and shovel in the pit. Note differences in angle of repose for dragline and shovel spoil.

dragline with two-position boom. When it went into service in August, 1948, the two-position machine marked up another first for Maumee. Earlier firsts include:

• 1911—Start of operations at Patricksburg, Ind., by the Rowland Block Coal & Clay Co., succeeded by Maumee. This was the beginning of uninterrupted operation of the oldest open-cut mining organization in the United States. For the past 27 yr, the Maumee organization has functioned under the guidance of O. S. Roberts, president; Hugh B. Lee Sr., vice president and general manager; David W. Aten, vice president and secretary; and B. C. Dudley, vice president in charge of sales. Following in his father's footsteps, Hugh B. Lee Jr., has functioned since 1943 as sales and coal-preparation manager. The operating and maintenance staff is headed by George Rea, general superintendent, with Lafe Stewart as chief engineer and W. E. Spainhower as master mechanic.

• 1917—First complete central shop, still operating at Jasonville, Ind., for the maintenance and manufacturing of stripping and preparation equipment.

• 1918—Earliest-known effort to reclaim stripped land; 4,700 fruit trees planted near Clay City, Ind.

• 1925—First extensive use of electric welding in rebuilding of first of three Marion 300 steam shovels, including increasing dipper capacity from 6 to 10 cu yd.

• 1932—First all-welded tipple designed and erected at Chieftain No. 20 by the Maumee organization. The new No. 20 plant (see p 65 of this issue) is the sixth.

• 1933—First operator to use an 18-yd dipper (company designed) on a 5480 shovel.

• 1937—All-time tipple construction record achieved at Mine No. 17; new five-track all-steel welded plant in operation 30 days after last coal was run through predecessor frame tipple.

• 1937—First 10-W electric dragline (12-yd, later 13-yd, dipper, 165-ft boom) put in operation at old Glory No. 17 mine.

• 1940—First 15-W electric dragline (13-yd bucket, 215-ft boom) installed at Linton No. 23 mine; also first use of a machine of this type, operating from a bench, in tandem with a shovel.

• 1945—First 1150-B walking dragline with 25-yd bucket and 180-ft boom in bituminous coal stripping installed at Linton No. 28.

• 1948—First 1150-B two-position-boom dragline, 25- and 20-yd buckets, 215-ft boom, installed in August, Chieftain No. 20 mine.

• **How Parallel-Tandem Stripping Developed**—Chieftain No. 20 was opened in 1932 with a Marion 5480 strip shovel and a 490 loading shovel in A pit. For a short time also, a second, or B, pit was operated with a 300 steam stripper and a 36 steam loader. About 1946, faced with deeper overburden and more difficult conditions in the remaining reserves, and with a long record of satisfactory experience with large walking draglines, the Maumee organization decided to go to dragline and eventually parallel-tandem stripping. With that in mind, the 1150-B two-position boom machine was purchased and, as noted, put in use in August, 1948.

Both the depth and character of the overburden combined to delay parallel-tandem operation to October, 1950. Overburden depth was less than the average in which parallel-tandem operation was contemplated. In addition, the bank contained a high percentage of soft material, which would have adversely affected spoil stability at the heights and slopes seen necessary in parallel-tandem operation.

Specifications of the new 1150-B machine include the following: weight, 1,400 tons; tub diameter, 50 ft, or 6 ft more than previous machines, for additional stability and flotation; size of walking shoes, 9x54 ft, also an increase; pressurized cabin, with the air blown in through oil-impingment filters, thus keeping out dust and dirt; Amplidyne control for faster acceleration and deceleration, a faster cycle and smoother digging, hoisting and swinging; and independent hoist and drag units, with twin 2-in hoisting and 2½-in drag ropes.

• **Swinging to Increase Spoiling Range**—Length of the boom on the new dragline is 215 ft. At an angle of 42 deg, this permits swinging a 25-yd bucket, with a reach, from center of rotation to center of the sheaves, of 174 ft. Using the 360-deg-swing technique developed at Linton Mine No. 28 by Oscar Wolf, superintendent, and Gento Gibson, now first-shift engineer on the new machine, the unit, employing centrifugal force to throw the bucket out as much as 40 ft, can move material nearly 430 ft from the farthest digging to the farthest dumping point.

With a 25-deg boom angle, the machine will accommodate a 20-yd bucket with no appreciable difference in cycle time. The total range is increased to about 490 ft. Ability to work on a fast cycle is evidenced by the swing record for the 10-day period July 16-26, 1950, when, working 85.5% of the available time, the machine averaged 73.74 swings per hour.

• **Drill Holes Cased**—Aside from

How Chieftain No. 20 Gets Results With Parallel-Tandem Stripping



PRE-PARALLEL-TANDEM OPERATION at 60 ft, with overburden drills on the bench in the background and tractor-mounted coal drill in the right foreground.



TRACTOR-MOUNTED COAL DRILL with integral compressor is driven from hole to hole.





NEW DIESEL-DRIVEN HAULAGE UNIT with torque-converter transmission speeds along typical Chieftain No. 20 road. Ground cables (right) with special junction boxes serve Chieftain 20 equipment.

its part in delaying the start of parallel-tandem operation, the character of the overburden in the past 2 yr has posed a major preparation problem involving, among other things, casing of drill holes down to the solid. This solid material is a ledge of limestone 4 to 6 ft thick resting on 9 to 12 ft of black slate immediately over the coal, which is approximately 5 ft thick. Over the limestone is a water-bearing gravelly clay, overlain by hardpan and surface.

Overburden drilling is handled by four Bucyrus-Erie 42-T churn drills swinging tools weighing approximately 5,000 lb. Bit gage is 10 in and the holes are loaded with Hercules Coalex-B, 8½-in by 50-lb cartridges. Spacing is 25x27 ft in the present overburden and breakage per foot of hole, excluding material benched off by the dragline, is 25 cu yd. Breakage per pound of explosive is 4 to 5 cu yd.

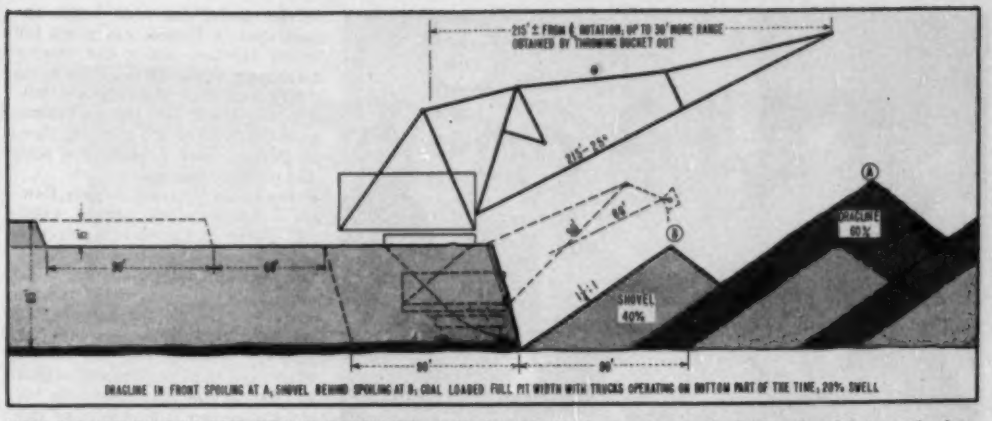
Casing is required because the sides of the holes tend to cave through the hardpan and gravelly clay unless supported. Casing diameter is 10¼ in inside. Maximum casing length is approximately 35 ft.

The casing is handled, set and pulled by the drills. In starting a hole, it is drilled as deep as possible —in any event far enough so that the top of casing will clear the tool string when hoisted to the top of the mast. Then drilling continues through the casing. If the hard material is down more than a casing length, the casing is permitted to sink as far as necessary, the aim being to seal off the gravelly clay and as much of the hardpan as possible to the solid.

Holes are drilled to the coal and are loaded through the casing with, in the present location, 400 to 425 lb of explosive. A rope is tied to the detonator wires and the casing then is pulled. Normally, the casing is started with a special double block, using a hook inserted in a hole cut in the casing at the top. Then the regular hoist is employed to pull it out. When the bottom end of the casing clears the top of the hole, the detonator wires are untied by hand from the rope and connected to the shooting circuit.

With natural conditions and the need for casing slowing up the drilling schedule to as low as one 60-ft hole per day in extreme cases, productivity in preparation at Chieftain No. 20 was 981 cu yd per man-shift in 1949, compared to 1,400 cu yd for all Maumee operations as a group. Conditions, however, were beginning to improve at the time this article was written.

● **How Parallel-Tandem Operates** —In the future, in the area scheduled for parallel-tandem operation, average thickness of the overburden is 65 ft. From the coal up, an average section is approximately as follows: black slate, 9 ft; limestone, 4 ft; gray shale, 7½ ft; limestone, 3 ft; gravelly clay, 34½ ft; clay and surface soil, 7 ft. With the additional hard material for use in



HOW PARALLEL-TANDEM OPERATION IS CONDUCTED at Chieftain No. 20, showing approximate division of work between the dragline and the shovel. All the coal is loaded and the two halves of the pit are stripped alternately to assure adequate spoil room.

building toes for spoil rows, parallel-tandem operation thus becomes more feasible, whereas the higher percentage of soft stuff previously encountered was considered excessive for reasonable spoil stability.

In parallel-tandem operation, the 1150-B is followed by a Marion 5480 shovel with 90-ft boom, 66-ft dipper handle and 18-yd Amsco dipper. At the start, the operating plan, shown in the accompanying sketch, was based on the dragline handling 60% of the overburden and the shovel 40%. Standard pit width is 90 ft and, to insure the necessary spoiling room for both shovel and dragline, the coal is loaded out completely to the highwall.

Preceding the shovel, the dragline benches down approximately 15 ft for the next cut ahead and then digs off the loose edge of the main cut, spoiling at maximum range on top of the spoil left by the shovel on the previous cut. The dragline makes no attempt to work to the coal, which would involve using it as a clean-up machine.

Following behind, the shovel removes the remainder of the main cut back to the highwall limit, spoiling in the interval between the edge of the coal and the toe of the dragline spoil. With the overburden divided up in this fashion, the dragline, considered by Maumee the more efficient machine and less costly to maintain, will have full working time, with the shovel working slightly less than full on occasions. Also, both machines are able to toe out with hard material for a more stable spoil bank. The shovel, particularly, which spoils against the coal, operates in hard material most of the time under usual conditions.

• Parallel-Tandem Advantages—Among the advantages expected from parallel-tandem operation are the following: (1) a higher production from the pit, and (2) some decrease in preparation cost because of decreased need for the extreme fragmentation necessary when the dragline operates alone. In addition, the dragline is relieved of the necessity for key-cutting to the coal, which is slow, hard digging.

Present pit length is approximately ¾ mi and will increase gradually. The pit is entered at approximately the center by an incline through the spoil. Stripping and loading in the two ends of the pit will alternate—a necessity when all the coal is loaded. This prevents, among other things, equipment interference and operation of trucks and other equipment under shovel and dragline booms. When the shovel and dragline complete stripping in one end of the pit, they deadhead back to the incline and start work on the other end, which has been cleaned up by the loading shovel in the meantime.

• Special Machine Drills Coal—Loading at Chieftain No. 20 is done with a Bucyrus-Erie 85-B shovel with 5-yd B-E coal dipper built to Maumee specifications. The coal must be shot for loading, and for this purpose drilling is done by a special LeRoi Tractair-wagon drill combination. This comprises a combination 105-cfm compressor and rubber-tired tractor, on the back of which is mounted a light LeRoi-Cleveland wagon drill.

A pilot model of the unit was first shown in 1948. It is completely self-contained, thus requiring no electric cables or separate compressors and hoses. It is driven by one man from hole to hole the same as a conventional wheeled tractor. As soon as the unit stops, drilling is started, using a 6-ft steel and 7-ft advance. Thus, there is no need to change steels. As a result, one man can handle all the drilling in one shift, where formerly two shifts were required. A second man charges and fires the holes. The unit also is employed for pulling cables and hoses and for other light drawbar jobs.

• Haulage Units Equipped With Torque Converters—Coal is hauled in a fleet of seven new Dart tractor-semi-trailer units, the first of which went into service in January, 1950. Capacity of the semi-trailers is 40 tons, replacing 30-ton units previously used. The tractors are equipped with Cummins NHRS 300-hp supercharged diesel engines and Allison Torquematic torque-converter transmissions.

Several years' experience with torque converters on crawler tractors led to the choice of similar equipment on the new haulage units, which handle much more smoothly and easily as a result of elimination of clutching and gear-shifting. Reduced shock through use of the oil coupling is expected to reduce engine and chassis maintenance. Top speed of the units is 30 mph, fully loaded, on a level highway. Front tires on the tractors are U. S. Royal Road Traction, 14.00x24, 20-ply rayon. Dual rear tires on the tractors and semi-trailers are U. S. Royal Con-Trak-Tor, 18.00x24, 24-ply rayon.

• Roads Built for High-Speed Haulage—Maximum haul at the



PREPARATION, OFFICE AND SERVICE—Denver Hadley (left) and Ray Luther, construction foremen; Lowe Bush, Maumee preparation engineer; Nelson Nicoson, chief electrician, No. 20; Ed Mills, Link-Belt Co.; Charles Aten, assistant clerk, No. 20 (son of I. W. Aten, chief clerk); Dennis Preble, carpenter foreman; Claude Turner, tipple foreman, No. 20; and D. L. Browning (seated), Maumee construction and maintenance superintendent.

present time is approximately 3 mi. Roads are 40 ft wide on tangents and 50 ft on curves. After a subgrade is established, 2 to 3 ft of pit rock is dumped and compacted. Then the running surface is composed of a layer of 2-in limestone rolled in and finished off with pea limestone, also rolled in. After construction, the roads are dressed as necessary with pea lime, kept smooth with an Allis-Chalmers road patrol and sprinkled regularly to keep down dust. The result is a smooth running surface without holes or depressions at all times.

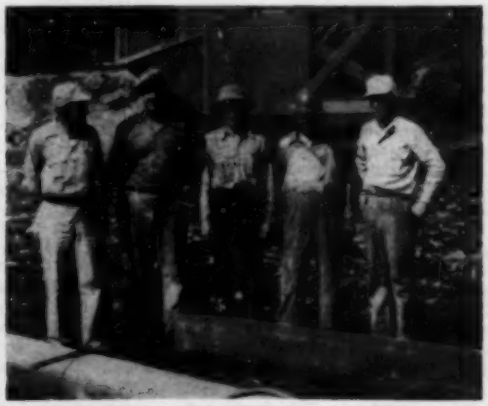
Auxiliary equipment at Chieftain No. 20 includes the following: Allis-Chalmers HD-19 tractor with torque-converter transmission and Baker hydraulic bulldozer, used with the dragline; a second HD-19 unit for cleaning coal and preparing the bottom for truck operation; a Caterpillar D-2 tractor and dozer, used with the loading shovel; an HD-10 unit with Baker hydraulic bulldozer for general use; an HD-7 with Gar Wood blade for cleaning the top of the coal; nine 3- and 4-in Fairbanks-Morse pumps with 25- and 40-hp motors for satisfactory service under the high heads encountered; a Barnes gas pump for utility service; and a 4x4 Dagley diaphragm pump purchased to move slurry and thus clean up the bottom for truck operation. Permanent water lines are screwed pipe; temporary lines, rubber hose with clamp-type couplings.

● **Stub-End Circuits Supply Power**—Ground cables supply 4,000-volt power to the main production units and to the stepdown transformers supplying auxiliary pit equipment. The advent of tandem operation was met by revising the ground-cable system to provide two stub-end circuits, one fed from a 15,000-kva G.E. portable substation at one end of the ¾-mi-long pit, and the second from a similar substation at the other end.

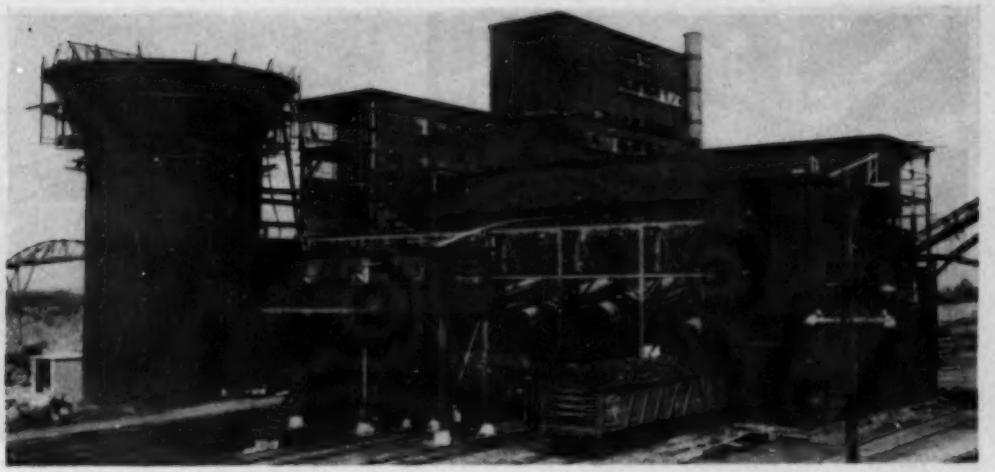
The cables, with G.E. plug-in boxes at intervals of approximately 900 ft, are lapped at the center. One stripping unit operates from one stub-end ground cable and the other from the other. If the units change places in shifting from one end of the pit to the other, the cables may be changed from one stub to the other, reducing the distances the machine cables must be moved. The 4,000-volt circuits are protected by the grounded-neutral system. On 440-volt circuits, the plan is to use a derived ground obtained with zig-zag transformers.

E. A. Brinton is superintendent at Chieftain No. 20 mine. He is assisted in pit operations by John O'Hern, day pit foreman; Charlie Lawson, night foreman; Wayman Burdette, drill foreman; Nelson Nicoson, chief electrician; and Roy Funkhouser, head haulage mechanic.





PIT AND GENERAL SUPERVISION—Gento Gibson (left), first-shift dragline engineer; J. R. Jackson, oiler; Vern Taylor, groundman; and E. A. Brinton, Chieftain No. 20 superintendent. At the right is Wayman Burdette, drill boss, with part of his crew.



NEW HOME OF MAUMEE CHIEFTAIN 5TH VEIN COAL is this six-track all-welded preparation plant incorporating trough and jig washers, centrifugal and heat-drying equipment, and oil-treating for maximum quality, uniformity and consumer satisfaction.

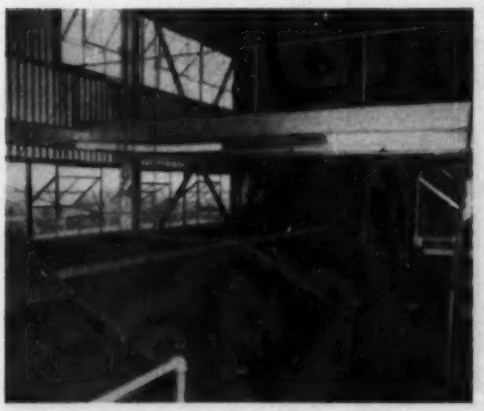
The Chieftain 20 Story—2

Jig and Trough Washing
Centrifugal and Heat Drying
Crushing, Sizing and Oil-Treating

SIXTH IN THE SERIES of company-erected all-welded operations, the new Chieftain No. 20 preparation plant of Maumee Collieries Co., Riley, Ind., replaces, on the same site, the first of the welded plants, completed in 1932. The new plant is designed to make Maumee Chieftain 5th Vein Coal, like the company's other products—Old Glory Brazil Block, Airline 5th Vein, Linton 4th Vein and Sullivan 7th Vein —even "cleaner, hotter and better."

Shipping over the Milwaukee and producing from the Indiana 5th Vein, the Chieftain No. 20 plant includes six loading tracks, jig and trough washing equipment, centrifugal and heat dryers, and oil-treating equipment for assuring maximum quality, uniformity and consumer satisfaction.

• **Sizing, Crushing and Oil-Treating**—Sizes normally shipped are: 10x28 carbon, 3/8x28 screenings, 3/4x28 screenings, 3/4x10 stoker, 1 1/2x28 screenings, 1 1/2x3/4 nut, 2x1 1/2 stove, 4x2 egg and 8x4 fur-

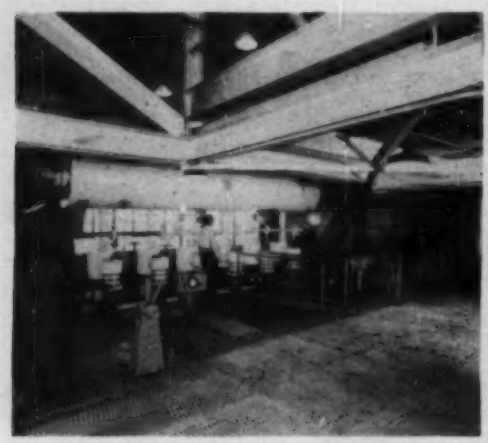


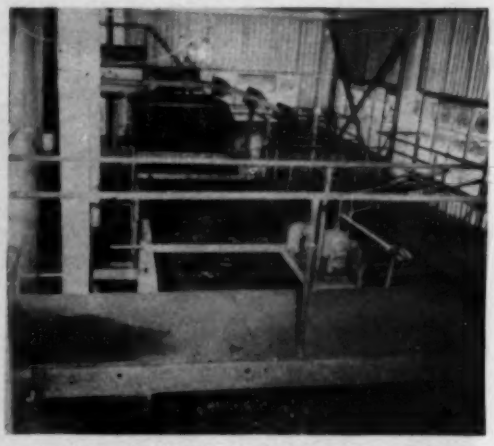
FIRST STEP IN THE PREPARATION CYCLE is screening and treatment of plus 7-in coal in a rotary breaker.



MINE-RUN SHAKER discharges plus and minus 3-in coal to top and bottom runs of a washer distributing conveyor.

Jig and Trough Washing Assure Cleaner, Hotter Product

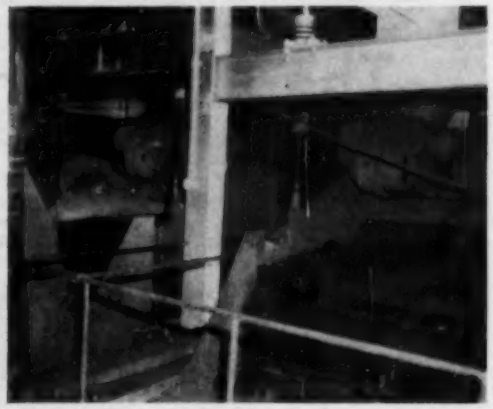




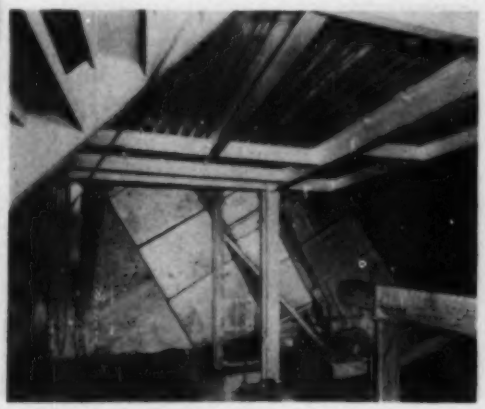
AIR-PULSATED JIG (left) cleans minus 3-in coal. Plus 3-in is cleaned in a trough separator (right). All material from the jig elevators is reject. Material from one elevator of the trough separator is crushed and recirculated to the jig.



BOARD-HUNG CRANK-DRIVEN SHAKERS positioned over the ends of the loading booms dewater and classify the washed coal.

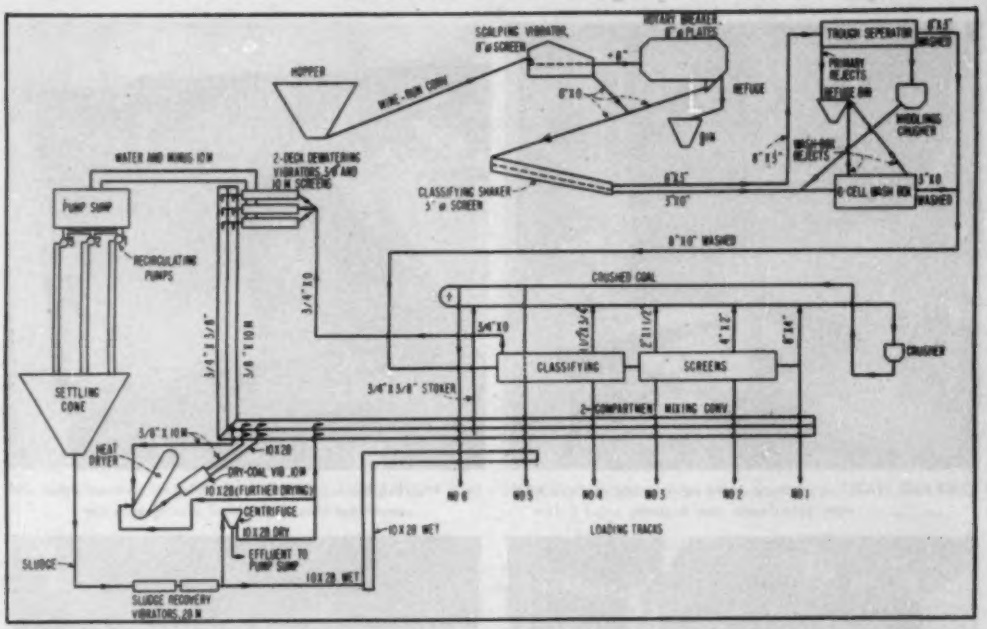


VIBRATING SCREENS handle second-stage dewatering of fines prior to centrifugal and/or heat drying.





CHIEFTAIN 30 DRYING EQUIPMENT includes a heat unit (left) for minus 3/8 coal, and a centrifugal dryer (right) for the 10x28, which can be sent to the heat unit for further treatment when desired.



SIMPLICITY COMBINED WITH FLEXIBILITY feature Chieftain No. 20 flowsheet based on jig and trough washing, centrifugal and heat drying, and loading on six tracks, with crushing facilities and oil-treating to round out the preparation cycle.

nace lump. All sizes up to ¾ in can be dried and all sizes up to 1½ in can be oil-treated. All sizes from ¾ to 8 in can be crushed, and six sizes or mixtures of any two or more can be loaded over booms at any one time.

Designed by Link-Belt and built by Maumee, the new plant went into operation Aug. 8. Rated capacity is 600 tph of raw feed. As a result of exceptionally clean loading in the pit, the refuse content of the raw feed is approximately 10%. Dismantling of the old No. 20 tipple was started June 12, 1950, and by the week of Aug. 14-18, the new plant was loading an average of 500 tons of cleaned, sized and treated coal per hour.

Operation and maintenance of plant is the responsibility of Claude Turner, foreman, and Wayne Tingley, night foreman. General supervision over preparation at Chieftain No. 20 and other Maumee plants is exercised by Lowe Bush, preparation engineer. Weighing and billing at No. 20 are handled by I. W. Aten, chief clerk, and Charles Aten, assistant.

● **Raw-Coal Treatment**—Coal is received in a 150-ton hopper at Chieftain No. 20. A three-speed plate feeder moves it out at rates up to 600 tph onto a 48-in drag-type elevating conveyor discharging to the main raw-coal conveyor, a second 48-in drag-type unit. This conveyor discharges to a 6x8-ft Link-Belt CA scalping vibrator jacketed with 8-in round-hole plate, thus starting the actual preparation cycle.

Plus 8-in material is discharged from the screen to a 9x17-ft Bradford breaker with 8-in round-hole plate. Material discharged at the end of the breaker goes directly to final refuse. Material through the screen joins the minus 8-in coal from the vibrator on the mine-run screen. This screen—a 7x30-ft crank-driven board-hung unit operating at 135 strokes per minute—comprises two decks. The bottom deck is a solid carrying deck. The top deck is jacketed with 8 ft of 3-in and 14 ft of 2-in round-hole screen.

Minus 3-in material is discharged from the carrying deck to the bottom run of a flight-type distributing conveyor for jig washing. Plus 3-in goes to the top run for trough washing.

● **Washing Cycle**—The Link-Belt trough separator cleaning plus 3-in material at Chieftain No. 20 is a 54-in unit with two refuse draws. Material from one elevator is pure refuse, which is discharged to a cross-belt for transportation to the final-refuse bin receiving both jig and trough refuse. Material from the second elevator is run to a 30x36 Link-Belt double-roll crusher for reduction to minus 2 in and return to the bottom run of the distribution conveyor for retreatment in the jig.

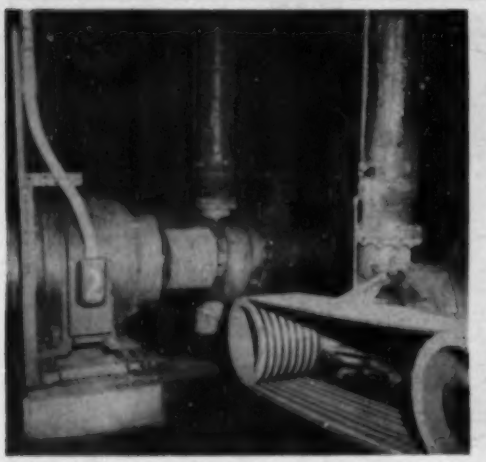
The jig at Chieftain No. 20 is a Type 6044E six-cell air-pulsated unit. The cells are divided into two primary and four secondary, with the product of both elevators going to the refuse. Thus, jig washing is a two-product operation.

● **Coarse-Coal Classification and Loading**—Coal from both the trough separator and the air-pulsated jig are combined and flumed to double-deck board-hung crank-driven classifying and dewatering screen. Before the coal reaches the screens, a large part of the water is unloaded through a 4x6-ft stationary dewatering screen.

The upper of the two classifying screens is 39½ ft long. The upper deck, 6 ft wide, is jacketed with 25 ft of 1½-in round plate. The lower deck, 7 ft wide, is jacketed with 24 ft 4½ in of ¾-in round. The lower classifying screen is 36 ft 3 in long, with 6-ft wide top deck (8 ft 5 in of 2-in round and 8 ft of 4-in round) and 7-ft bottom deck, blank except for discharge chutes.

The classifying screens are set over the ends of the loading booms handling coal down to ¾ in. Thus,

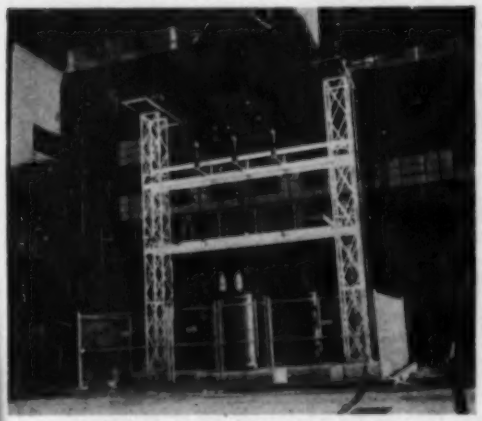
Centrifugal and Heat Drying Round Out Chieftain 20 Facilities

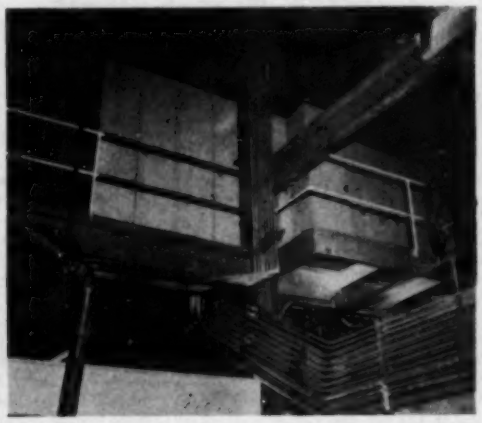


FINES AND WATER are pumped to the settling cone by three 4,000-gpm centrifugals, one a spare.



THIS DOUBLE-ROLL CRUSHER is installed to produce stoker and screenings from washed coal over ⅜ in in size





OUTSIDE TRANSFORMER STATION (left) serves plant through control center (top right). All wiring is in conduit.

the screens can discharge sizes from ¾ in up directly to the Link-Belt rescreening-type booms with pantograph transfer chutes. Mixing of sizes above ¾ in is done by manipulating the chutes on the screens. The mixing conveyor proper—a two-compartment unit—is used only for bringing coal under ¾ in back to the loading section.

Coal from the screens also can be diverted by separate chutes to a scraper-type conveyor discharging to a cross conveyor feeding to a Link-Belt 36x60 double-roll crusher which can, as previously noted, break any size down to ¾ in as desired. The crushed product is returned via the top run of the scraper-type conveyor to either No. 5 or No. 6 loading boom. Degradation from all booms goes to the bottom run of the mixing conveyor for return to the main raw-coal conveyor feeding the plant.

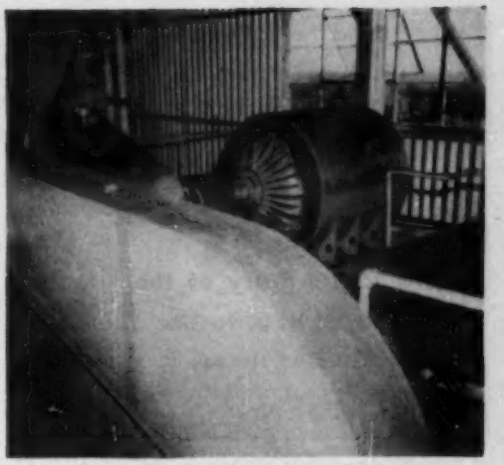
● **Fine-Coal Classification and Dewatering**—Minus ¾-in coal from the classifying screens is flumed to two 6x16-ft Allis-Chalmers Low-Head vibrators, with a third as a spare. The vibrators are preceded by a 10-mesh Bixby-Zimmer screen section. The double-deck Low-Head screens make the following products: ¾x⅜, ⅜x10 and minus 10-mesh. All the latter, from both the vibrators and fixed screen, goes to a pump sump and from there to the settling cone. This same pump sump is arranged to receive all casual, drip or other water carrying fines.

From the settling cone, slurry flows by gravity to two 5x14-ft Low-Head vibrators in tandem, with fresh-water spraying and dewatering on the first and dewatering only on the second. Minus 28-mesh material through the screens is pumped to the pond. Material over the screen—10x28-mesh—can be sent, via one compartment of the mixing conveyor, to No. 6 boom for loading, or by another conveyor, to a 48-in Type S C-M-I centrifugal drier rated at 25 tons of 10x0 per hour. Centrifuged coal can be sent to No. 6 boom or on to the heat drier.

● **Heat Drying**—Both of the other two sizes made on the 6x16-ft Low-Heads—⅜x10 and ¾x⅜—can be loaded directly via the two-compartment mixing conveyor, or can be sent on to the heat drier—a Link-Belt Multi-Louvré unit sup-



ALL PLANT AND LOADING CONTROLS are centered in a control station out in front of the loading booms.



DRIVE EQUIPMENT includes totally enclosed and fan-cooled motors, with V belts, gear reducers, roller chains and combinations.

plemented by six Pangborn cyclones for dust collection. Normally, however, the heat drier will handle only ⅜-in coal, either ⅜x10 or ⅜x28, the latter including the centrifuge product. If the heat-drier feed includes material down to 28 mesh, drying will be followed by further screening on Selectro vibrators to obtain, when desired, a 10x28 product in addition to ⅜x10.

● **The Multi-Louvre Drier**—A 12x 24-ft unit—is rated at 100 tons of ¾x0 per hour. Moisture will be reduced to approximately 2% surface. Drying gas will be supplied by a Furnace Economy Co. furnace fired by Firite spreader stokers. The fuel will be the product of the cyclone dust collectors—approximately 28 mesh—plus 1-in raw coal from a short screen section in the bottom deck of the raw-coal shaker.

Rated capacity of furnace is 41,000,000 Btu per hour. Air is blown into the furnace by a Buffalo 5LL blower rated at 14,000 cfm at a 3-in water gage. Outlet temperature of the furnace is expected to be approximately 700 F; of the drier, 350 F. The drier exhaust is a 600 ME Class 3 ABR exhauster (New York Blower), rated at 75,000 cfm, 275 deg, 6-in water gage. The furnace blower is equipped with a 10-hp motor direct-connected; exhauster, 75-hp motor, belted.

● **Power Supply**—The plant is operated by 55 major motors—Allis-Chalmers Types ART, ARZT and ARW totally enclosed and fan-cooled. The largest is 125 hp; the smallest, 1½ hp. Total connected horsepower is 1,560. Drives for the most part are Texrope V-belts and Link-Belt gear, roller chain or combinations, with Link-Belt variable-speed units as necessary.

All wiring is in conduit from a G.E. Cabinetrol center on the third floor of the plant. All starting and stopping of motors is controlled by push buttons from a console-type board in the operator's station over the loading booms. Signal buttons are placed at strategic points throughout the plant for emergency stopping, and for starting and stopping for maintenance or other purposes. Controls for the Shaw-Box boom hoists and the Maumee-built counterweighted car retarders also are centered in the tipple operator's station.

Construction of the plant, as noted, was done by Maumee employees, with supervision by the mine management and D. L. Brown, superintendent of construction and maintenance. In addition to the 1932 and present Chieftain No. 20 plants, other all-welded Maumee plants are: Linton No. 28 (originally at No. 25 and then re-erected at No. 28, both times by welding), Sponsler No. 23, and Old Glory No. 17.

● **Color-Dynamics**—Roofing and siding at Chieftain No. 20 are Robertson Protected-Metal. Color-dynamics principles have been followed in painting both exterior and interior. Paint was furnished by the Linton Hardware Co. and the color scheme is as follows:

Exterior—Maroon, with black trim on sash and trim (steel sash by W. J. Holliday & Son, Indianapolis, and glazing by Pittsburgh Plate Glass).

Interior, siding and roofing—Aluminum; also on board-type hangers.

General machinery—Vista green.

Tanks, chutes and equipment subject to drip or slate-gray splash—Slate.

Coal-drier kiln—High-heat gray.

Stairs, hand rails, low-passage areas—Yellow.

Coal-drier stack—Heat-resistant aluminum.

Air lines—Ivory. Steam lines—Aluminum. Water lines—Green. Conduit—Orange. Oil lines—Blue.

In general, the color scheme follows the recommended plan of yellow for aisles, stairs, walkways, and orange for caution areas.

● **Water Supply**—Fresh water for screening and make-up is added through sprays over classifying, sizing and dewatering screens, and by pumping directly to the settling cone. The source is a strip pond approximately half a mile away, at which a 4-in 800-gpm Fairbanks-Morse float-controlled centrifugal is located. This unit pumps to reservoirs at the plant, from which the water is relayed to the plant itself by a second pump of the same type.

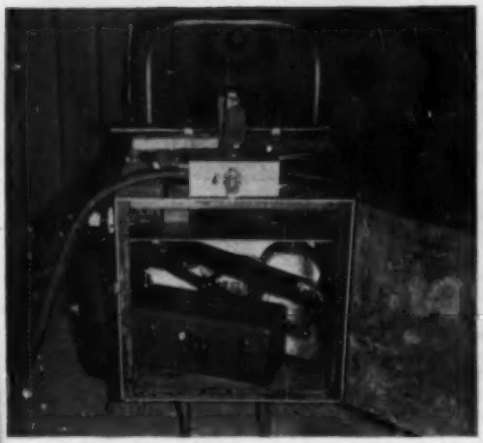
Two 12x10 Allis-Chalmers 4,000-gpm sludge pumps, with a third as a spare, pump from the main sump to the settling cone. A 4-in Allis-Chalmers unit moves the 28x0 to the pond, with a 3-in unit handling centrifugal-drier effluent to it.

Plant heat will be supplied through unit heaters from a stoker-fired Terre Haute Boiler Co. plant.

- **On-The-Section Vulcanized Splice in 20 Min for $1.50 Sharply Reduces Trailing-Cable Maintenance Cost**
- **Here Is the Story of the Supplies You Need, How to Use Them and Where to Get Them**



CABLE-REPAIR "SHOP," rubber-tire-mounted, carries service to site of cable failure in working place.





SUPPLY CABINET in cart (left photo) holds splicing tools and materials. Right photo shows cart "buttoned up" and ready to answer calls for cable service. Traveling repair service eliminates need for disconnecting broken cable from equipment.

How Consolidation Coal Co. (W. Va.) Attacked a Problem and Came Up With

A New Cable-Splicing Method

By CHESTER CONRAD, Assistant Maintenance Superintendent
Consolidation Coal Co. (W. Va.), Division of Pittsburgh-Consolidation Coal Co.

STUDIES OF A NEW SYSTEM for splicing trailing cables, developed by Consolidation Coal Co. (W. Va.), established the following advantages:

Adapted from a paper presented at the Nov. 24-25, 1950, meeting of the West Virginia Coal Mining Institute and Central Appalachian Section, AIME, White Sulphur Springs, W. Va.

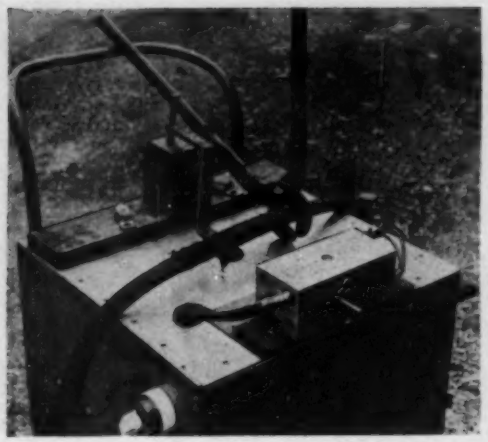
1. Average time required to splice two- or three-conductor cable, Nos. 4, 2 or 1, with regard to copper size, is 20 min.

2. The cost per splice is approximately $1.50 for No. 4 three-conductor cable.

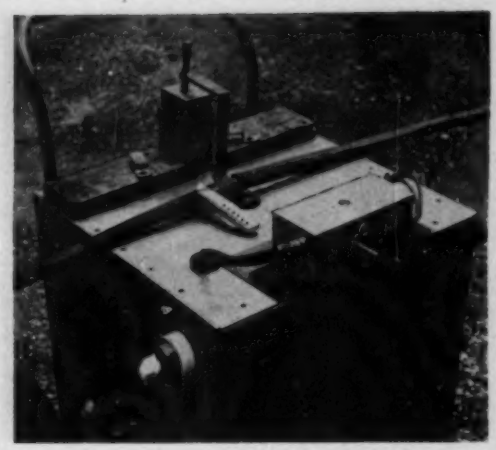
3. An operator is readily trained in one or two shifts, and the trainee need not be a skilled worker.

4. Labor costs for removing or installing cables on equipment is eliminated because the splicing is performed on the section, thus removing the need for spare cables and permitting considerable reduction of cable inventories.

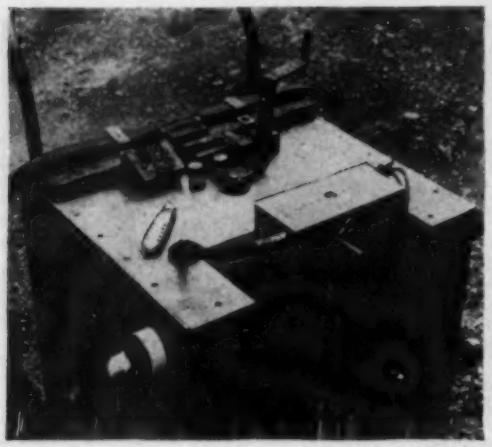
These benefits represent a neat saving in the cost of cable maintenance. During periods of ma-



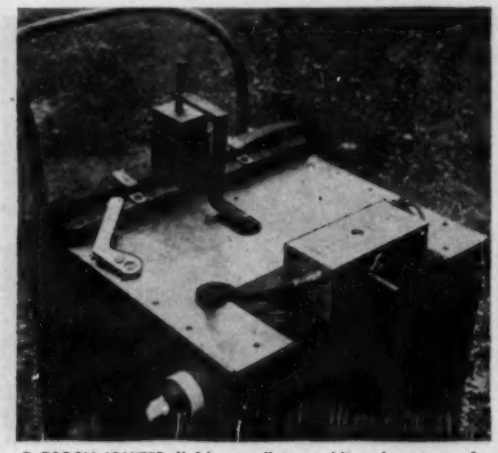
1 FIRST STEP in "on-the-section" splicing is trimming cable ends or cutting out temporary splice by cable cutters.



2 AFTER CUTTING, two-conductor cable is ready for jacket removal, which is done with replaceable-blade knife.



3 WITH JACKET REMOVED, cable is placed in shop-made carbon mold for copper-thermit welding of both conductors.



4 TORCH IGNITER (left) sets off two welding charges, one for each conductor. Carbon mold is clamped in place. **MORE ▸**

terial shortages, such as is now in evidence, a program of this type is advantageous to all concerned.

Study of Past Experience Consol's First Step

● **Experience of the Consolidation Coal Co. (W. Va.)** is considered to be representative of the coal industry, and that experience suggested there must be an easier and more efficient means to provide better cable maintenance. In early 1947, therefore, a program was initiated to investigate conventional splicing methods and materials. Equipment was secured and considerable experimentation was done in an effort to exploit various techniques of splicing and vulcanizing.

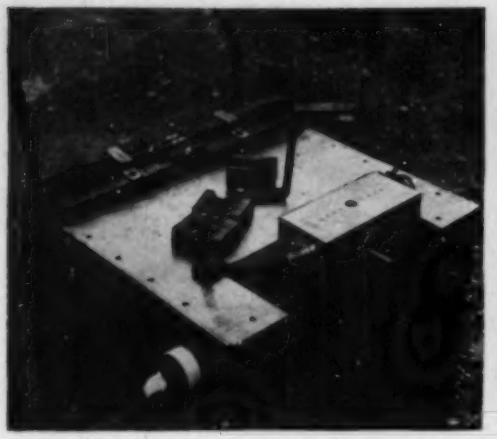
More than two years later it was decided that, although satisfactory cable repairs could be made, the process was too time-consuming, required too many spare cables and was not inexpensive.

Some 15 mo ago a consulting chemist was employed to direct research in the application of thermoplastics to cable splicing. The result of the research is the application of Plastisol (Chemical Products Corp., E. Providence, R. I.) to insulating and jacketing splices.

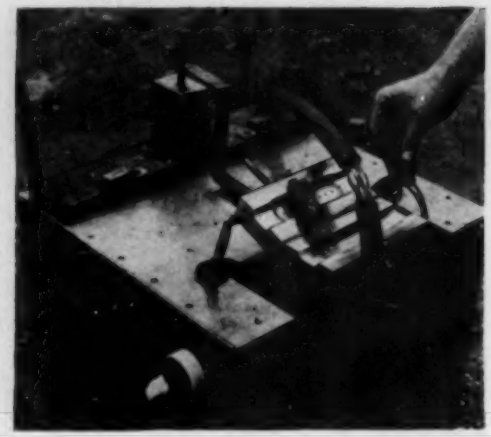
● **Cable splicing** is currently classified as either temporary or permanent. A temporary splice is one not vulcanized by external heat. The procedure consists of rejoining the conductors, insulating with several layers of rubber splicing tape and binding with friction tape. Multi-conductor cable splices require friction tape to bind the splices together forming a temporary jacket and that the surface be covered with moisture-resistant paint.

A permanent splice is one made in such a manner that the spliced section possesses the same mechanical, electrical and dielectric properties as the original cable, with the additional proviso that rubber insulating and sheathing tapes are properly vulcanized and cured. **MORE ▸**

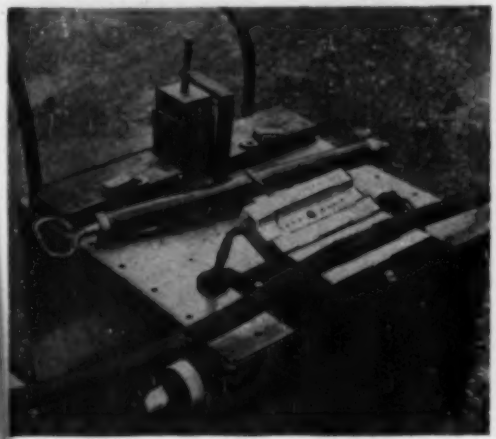
Step-by-Step Application of New Cable-Splicing Method—Cont'd



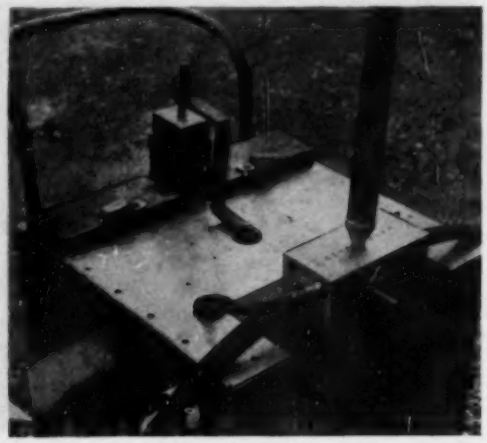
5 CABLE SPLICED and mold removed, rough runners are trimmed off before next step. Cable now has mechanical strength.



6 PLASTIC SEPARATOR is placed over trimmed, welded conductors. Punched holes in separator improve bond with final jacket.



7 READY FOR VULCANIZING, the splice is placed in aluminum mold. Cable jacket, near splice, is clean and adhesive-coated.



8 THERMOSETTING PLASTIC, pumped into mold with grease gun, is cured for 5 min at 350 deg F. Switch (left) controls heat.

Splicing procedures conforming to the definitions are rather generally known; also it is generally known that little has been done for a considerable time to improve methods, equipment or materials.

It is true that independent cable-repair services have done commendable work, but, by and large, cable expenses represent too great a portion of machine maintenance cost.

Solution to the Problem

● **The new method** developed by Consolidation Coal Co. (W. Va.) results in a permanent splice.

Plastisol (vinyl plastic and liquid plasticizer) has high viscosity at room temperature. Application of heat causes the liquid to change to a solid state. The solid is flexible, has reasonably good abrasion resistance and is a good insulating material. Splices insulated and jacketed with Plastisol have performed creditably. There have been splice failures but these have been confined to shuttle-car cables. The source of trouble is in the splice and the problem can be solved by observing a few essential requirements, as follows:

1. The splice should be short—1 in or less is desirable.

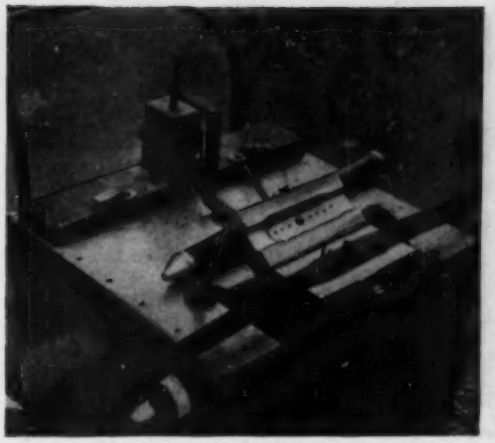
2. Knife nicks or other damage to the wire strands adjacent to the splice must be avoided.

3. The splice should be flexible to the extent that the cable is not permanently kinked at the splice after passing over the smallest sheave of the spooling device.

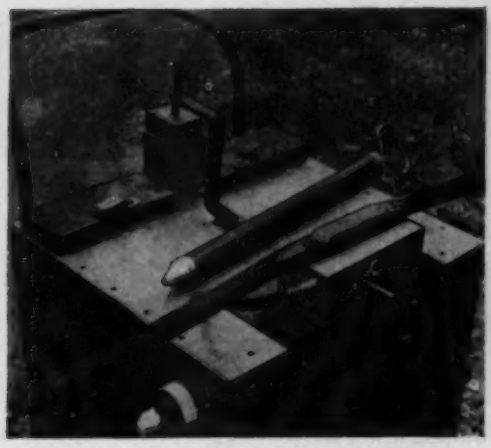
4. There should be no sharp surfaces exposed at the conductor splice.

5. Correct positioning of the separator should be carefully observed.

Permanent Plastisol splices have been made on the section and in the shop. However, all equipment, built or being developed, is designed for making cable repairs on the section.



9 HINGED MOLD, with internal heating units, is opened, excess plastic is trimmed off and splice is permitted to cool.



10 WORKMANLIKE SPLICE was completed by one man in 20 min at a cost of about $1.50. Cart is ready for its next job.

How Cable Splices Are Made

• **As developed and practiced** by Consolidation Coal Co. (W. Va.), the job of cable repair is performed by one man. A lightweight, combination work table and cabinet, which contains molds, fixtures and supplies, is mounted on two pneumatic-tired wheels for quick tramming and set ups.

The new method of splicing utilizes the copper-thermit welding process. Two No. 25 cartridges of Cadweld, one for each conductor in a two-conductor cable, are used. Cadweld is manufactured by Electric Railway Improvement Co., Cleveland, O., and distributed by S. E. Gans Co., Pittsburgh, Pa. Conductor insulation consists of preformed Plastisol, which separates and insulates the conductors.

Copper-thermit welding requires carbon molds for each size cable. These are arranged so that all conductors are contained within the mold, thus only one closing and opening operation is required to complete a splice. This feature insures that each conductor will assume a proportional share of the tensile load.

Preformed conductor insulation is made by dipping heated rods, of correct diameter and spacing, into black Plastisol, No. S2537, obtained from Stoner Mudge, Inc., Pittsburgh, Pa. Repeated dippings produce desired thicknesses. The integrally made tubings are split lengthwise before the rods are removed and sections are cut to length as needed.

• **Shop-made aluminum molds** are used in applying and vulcanizing the jacket over the splice. The molds are in two sections, with half the mold cavity in either section and the sprue and air vents in top section. Each mold section is bored lengthwise to accommodate two 250-v, 150-w heating units. Separate molds are required for each cable size.

Electric power at 250 v is connected to the cart by means of a cable. Protective devices are built into the equipment, and heating is controlled manually with a range-type snap switch, with low, medium and high heats available.

Temperature determinations are made with Tempilstik, a crayon-like material with a fixed melting point. Operating temperatures are not critical and Tempilstiks for 325 deg F and 375 deg F provide test limits for satisfactory results. Tempilstik is supplied by Tempil Corp., 132 West 22nd St., New York 11, N. Y.

• **Cable ends are prepared** for splicing by removing 2 in of jacket, exposing 1 in of conductor and leaving room for scarfing the jacket back ½ in.

Mousing wire, No. 22 bare soft copper, is served over the cable strands, starting at a point ¾ in from the end and covering all but 1/16 in from the end. The cable ends are spaced from 1/16 to 3/32 in apart in the copper-thermit mold, which was made from a carbon block in the company's central shop. The mold is closed and clamped and the Cadweld charges are set off with a torch igniter. When the weld has cooled the mold is opened and the mold runners are cut off the welded joint.

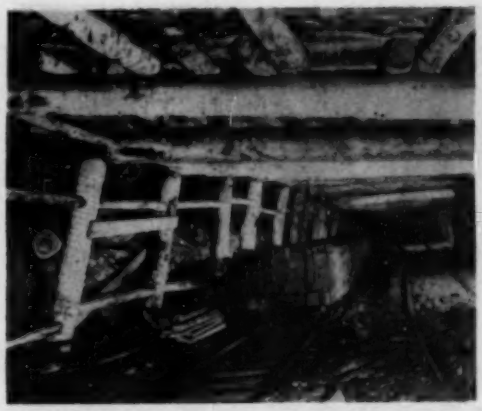
Next, the separator is installed and temporarily secured with insulating Scotch tape. The jacket ends are cleaned with toluol, roughed with a clean file and coated with Adhesive No. L7706 (Chemical Products Corp.), on the surfaces to be covered by Plastisol. Then the spliced cable is ready to be placed in the aluminum mold, after the mold has been brushed with Dow Corning Mold Release Emulsion No. 35.

Gray Plastisol is applied by means of a volume-type grease gun. During the 2-min interval required for drying the adhesive, a small amount of Plastisol is placed in the lower mold cavity to centrally locate the splice.

The splice then is placed in the aluminum mold and the sections latched. Plastisol is forced into the mold cavity at the sprue until it shows at the vents. After 5 min the cable is removed from the mold, and the vulcanized splice is complete, except for cooling to room temperature and trimming excess Plastisol.

• **Associated with machine failures,** cable failures being most prevalent, are certain intangible costs because sometimes an entire production panel is affected. Such costs can be reduced only when the frequency of failures is reduced. Good splicing, when applied with minimum delay, will certainly contribute to reducing cable failures.





GENERAL VIEW of wood-preserving plant shows craneway, timber storage and peeler and retort valvehouse (background). Storage tank on the hill contains preserving solution. Retort-preserved timber (right) features economy and immediate usability.

How Glen Alden Coal Co. Employs a Wood-Preserving Plant To Get . . .

Longer Life From Timber

With Almost 1,000 Mi of Haulageway To Maintain, Efficient Timber Preserving Methods Are Important To Anthracite's Largest Producer—Economy and Immediate Usability of Treated Timber Are New-System Features

By EDWARD M. GRIFFITH, Assistant Purchasing Agent
Glen Alden Coal Co., Wilkes-Barre, Pa.

THE SINGLE FACT that the Glen Alden Coal Co., Wilkes-Barre, Pa., maintains almost 1,000 mi of underground haulageway is sufficient to emphasize the importance of the permanent timbering problem in our operations. Also, it is a peculiarity of anthracite mining that haulage roads, even unimportant ones, are sometimes maintained for periods far exceeding the length of time required to recover the coal developed by those roads. This is a result of heavy faulting in the beds which may necessitate approach by a circuitous route.

These two conditions led to consideration of methods for increasing the life of timber, because timber is readily available, easily worked and has sufficient strength to support the medium-heavy roof.

● **Treated Timber in Glen Alden Mines**—We do not wish to leave the impression that Glen Alden was so far behind the times that treated timber had not been used in the past. Treated timber installed in 1914 is still standing in excellent condition in our mines. This timber was treated by a creosoting process in our own plant at that time. However, the hazard of fire in dry sections, employee resistance to handling this timber and the compensation costs of injuries resulting from handling creosoted timber prompted its abandonment, except for treating permanent ties.

From 1939 to 1948, zinc chloride was used as a preservative. Because of costs its use could not be as widespread as the company's projected timber-treating policy required. Also, the efficacy of zinc-chloride treated timber in very wet places is debatable.

In the past, the labor cost of replacing fallen timber was practically equal to or less than the cost of treatment. However, because of increases in labor rates and decreases in labor productivity, this equality was destroyed, and Glen Alden renewed its study of timber preservation and the extension of its use in our mines.

● **Timber Requirements and Treatment**—Our study showed that initial requirements for all types of treated timber would be 7½ million bd ft per yr. This amount would decrease in the future because a sizable portion would be used to replace failing untreated timber already in place in the mines.

Our experience with the hazards and plant cost of the creosote process, and the treatment cost and unsatisfactory balance between fluctuating demands and delivery of zinc-chloride or other pressure-treatment methods prompted us again to consider a company-operated plant which could adapt its output to colliery demands. Meanwhile, investigations were made with the object of selecting a preservative which could be applied at reasonable cost. The Osmose process was selected.

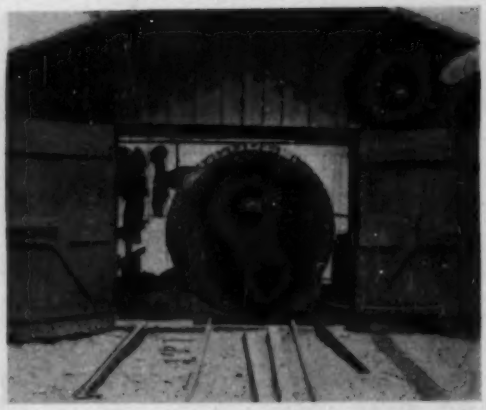
This patented process utilizes the natural force of osmotic pressure, which is a measurable force resulting from the characteristic of a

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Presented under the title, "Initiation and Operation of a Timber Treatment System for a Group of Pennsylvania Anthracite Mines," at the October, 1950, meeting of the Mining Section, National Safety Council, Chicago, Ill.



RETORT AND VALVEHOUSE, heart of the timber-preserving plant, are designed to permit treatment of 7½ million bd ft per yr.



STUB RAILS provide access to retort, shown here with cover closed on a charge of timber being processed.

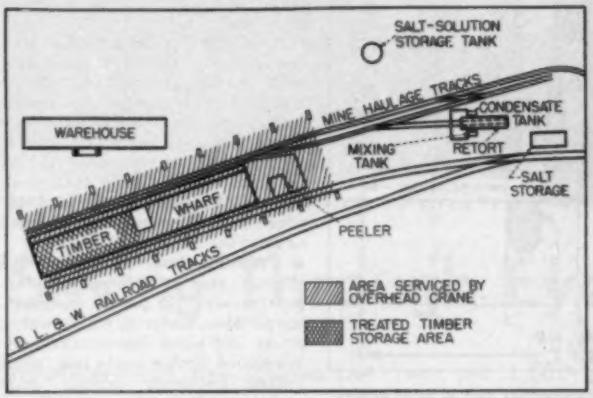


FIG. 1—PLANT LAYOUT provides for efficient materials-handling with minimum labor. Site was chosen to utilize existing facilities.



DIMENSIONED TIMBER is chained to retort cars for treatment in next cycle.

system to attain balance or equilibrium in a solution. Osmotic pressure is the force between two membrane-separated solutions of different concentration which causes flow of components through the membrane from the more-concentrated to the less-concentrated medium until equilibrium is attained.

The Osmose "normal" process makes use of osmosis by providing a thin coat of a water solution of Osmosalts on the outer surfaces of green or moisture-laden wood. The coating represents the concentrated chemical medium, the sap in the wood the dilute medium, and the cellular wood structure the separating membrane. The water solution of Osmosalts is applied by dipping, brushing or spraying.

Osmosalts is a patented mixture of chemical salts, each of which has value as an agent toxic to fungi. Sodium fluoride, dinitrophenol, potassium bichromate and sodium arsenate are major ingredients.

The toxic value of sodium fluoride in a concentration of 0.2% has been well known to wood-preservation authorities for years. Dinitrophenol, also a highly toxic preservative, serves a double function by making the cell walls of the wood impermeable, thus retarding leaching. The potassium bichromate assures retention of preservatives in wood where extra protection against leaching is needed. The arsenic in Osmosalts fortifies toxic value as required in termite-infested areas.

• **Treating Methods**—Optional methods of applying Osmosalts are the normal, or dip, method, and the plant, or retort, method.

The normal, or dip, method consists of dipping the material to be treated into a tank containing a solution of Osmosalts, then stacking the timber in covered piles for 30 days to permit penetration by osmosis.

The plant method consists of alternately steaming the wood and subjecting it to a vacuum. The material is then surrounded with the Osmosalt solution. Initial penetration is accomplished in this treatment and the timber is ready for immediate use. In spite of the additional equipment and capital expense involved, the plant method was chosen to eliminate the long storage period and to assure fast delivery of treated timber on short notice.

Plant-layout (Fig. 1) received considerable attention because of the large amount of material to be handled and our desire to keep labor requirements to a minimum. Power, steam at the necessary pressure,



CREOSOTED TIMBER (front), installed in 1914, is still good.



ZINC-CHLORIDE-TREATED TIMBER also gives long service.

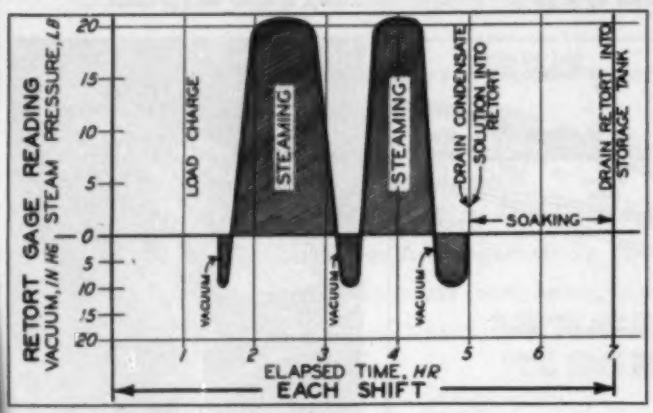


FIG. 2—TREATING CYCLE is adaptable to charge characteristics, such as initial temperature and moisture content of the timber.

water, and trucking and rail facilities were available at one of our collieries, and a craneway was already in place which could be extended to cover the proposed plant area. A timber peeler is provided for the preparation of material prior to treatment in the retort.

The crane carries timber from the storage piles and deposits it on the retort cars or on a skidway to the peeler, as required. Two sets of retort cars are used to make it possible to unload a finished charge and load a new charge while a charge is being processed.

A typical retort cycle, shown in Fig. 2, is subject to changes in the length of steaming and immersion. The steaming period is varied according to the temperature and natural moisture content of the material to be treated. The immersion period should vary from 1 to 2 hr, depending on the least through-dimension of the material, species of wood and the available face of the material.

The vacuum is obtained by the use of a steam ejector and no difficulty is encountered in reaching the required vacuum.

After the cycle is completed the Osmosalt solution is pumped from the retort to the storage tank and the ready-for-use timber is taken from the retort.

● **Timber Applications**—The general uses of treated timber follow:

1. New and replacement timbers in permanent haulage and ventilation openings, as determined by the operating and mining engineering departments.
2. All track ties except those used in rooms.
3. All structural timber for the framing of new buildings or for replacement of existing framing.
4. All timber used in flume construction which will be in contact with the earth, such as cribbing, posts and sills.

A colliery requiring treated timber issues an ordinary requisition with the added notation, "To be treated." The purchasing department purchases or withdraws from warehouse stock the necessary material, which is delivered to the treatment plant. After treatment, the cost of the material and the added cost of treatment are charged against the colliery.

● **Treating Cost**—At present the average cost of treatment is approximately 1½c per bd ft, including all labor, material, steam, water, power and plant depreciation. Dimensioned timber costs less, while timber requiring peeling costs more, but these are not differentiated in our accounting.

Although a great part of plant output is for custom service, that is, on specific order by the collieries, there is a constant demand for standard products, such as mine ties and structural materials. The latter are run in with custom treatments to utilize full retort capacity and are stocked for future use. The plant is always kept up to capacity.

In the first year of operation over 2 million bd ft were treated and our goal of 5 million bd ft for the second year seems reasonable.

While we are convinced that plant operation is successful, the full results of the program will not be apparent until from 3 to 5 yr have elapsed. However, in view of long experience with this process in Europe and results of tests by the Forest Products Laboratory of the U. S. Dept. of Agriculture, we are confident the process will meet the standards of service dictated by our past experience with other timber.



"THE FINEST GOGGLE PROTECTION can be given to a thousand men for the cost of one eye . . ."

Saving Through Eye Protection

Situation—157 Eye Injuries per Year per 1,000 Men

Cost—Up to $12,000 for One and $40,000 for Two Eyes

Remedy—Complete Eye Protection for All Employees

Results—75% or More Fewer Disabling Eye Injuries

By WM. J. MAHER, Mine Safety Appliances Co., Pittsburgh, Pa.

IF YOU SAW somebody setting fire to $1,000-dollar bills you would be startled. Yet, what we are doing with our national eyesight is just as senseless.

It is possible to prevent 98% of the 300,000 eye injuries that cost employers $110,000,000 annually, with an estimated cost to employers and the community of another $100,000,000.

In Pennsylvania alone, during a 10-yr period, 10,781 miners suffered eye injuries that resulted in total or partial blindness. This figure, reported to the Pennsylvania Department of Labor and Industry, includes only injuries covered by the compensation law. How many less serious eye injuries occurred and how much suffering and impairment of vision they caused, no one knows.

Judging from available data, it appears that the law of averages imposes 157 eye injuries per year per 1,000 workers on the coal-mining industry. Out of every six men who start in the mines, one will have lost his sight or suffered a serious eye injury before his working life is over if this present rate of eye accident continues.

Abstract of a paper entitled "The Importance of Eye Protection in Coal Mining" presented at the 1950 meeting of the Kentucky Mining Institute.

What Eye Injuries Cost

• "How much is an eye worth?" "Whose eye?" you ask. It makes a difference, you know, whose eye is involved, but the National Safety Council estimates that workers are compensated at a rate of approximately $2,000 for one eye and about $7,400 for both eyes. Of course, these figures are ridiculously low if it is your or my eye upon which a monetary value is placed. The National Safety Council further estimates that the cost of one eye injury to industry is about $12,000 and the cost of both eyes runs as high as $40,000.

The injury frequency and severity rates of companies reporting to the National Safety Council in 1948 was the lowest on record. More than 6,700 companies reporting on the experience of nearly 7,000,000 employees, and representing all of the major industries in the country, had average frequency and severity rates of 11.49 and 1.12, respectively.

The frequency rate was 13% below that of 1947 and the severity

rate was down 9%. The mining and lumber industries had frequency-rate reductions in 1948 exceeding the reduction in the average rate for all industries, and the standing of the mining and lumber industries remained the same as in 1947, with lumber in last place.

For all of the companies reporting the average frequency rate of disabling eye injuries was 0.67 per million man-hours. However, the average rate for mining companies was 4.85.

The latest available figures obtainable from the Accident Analysis Branch of the U. S. Bureau of Mines covering all eye injuries reported by the bituminous and anthracite mines in the entire country for 1948 show a total of 4,142 disabling eye injuries, resulting in 118,532 days lost. In comparison, there were 53,472 disabling injuries of all types with 2,412,888 days lost. In other words, eye injuries represent almost 8% of all disabling injuries that occurred in coal mines in 1948.

● **How Eyes Are Injured**—The following figures, compiled by the National Safety Council, give a picture of how eyes are injured:

Flying objects	80%
Tools or parts of machinery	8%
Splashing liquid	7%
Explosions	2.5%
Falls	2%
Infections	0.5%

Who is immune to an eye accident? This may seem a foolish question, but how often have thoughtless, impractical people told you where goggles should be worn and where they should not? A National Safety Council survey shows that 72% of all eye injuries occur on jobs regarded as non-hazardous to the eyes. One of the reasons that eye protection has not made greater strides in industry is that many people who know very little about the subject are stating very definitely what should be done about it.

Although the easiest of all permanent injuries to avoid, eye losses are the most costly of all. In unrecorded attendant economic loss to the worker, and in social dislocation, they undoubtedly rank second only to death itself. Few workmen realize that at the very least they are risking a 33⅓% cut in earning capacity for the rest of their lives every time they risk the loss of an eye.

No other reason is needed for directing special attention to eye protection in industry. Enforced eye protection will save eyes, and this is not a guess. It has been proven by companies who decided they no longer have money to burn. In every instance they found that protecting eyes is good business. The use of the proper type of goggles or plastic eyeshields will prevent most of the eye injuries that cost employers alone $78,000 a day. Every 3 min—night and day—another American worker suffers an eye injury from large or small flying objects, splashing liquid, flying dust or powder, injurious light rays or intense heat.

Accidents are only one entry on the debit side of our national eyesight ledger. The caveman's eyesight was satisfactory if he could see the animal he hunted for food. The weaver, working a hand loom, did not have to "strain" his eyes making fine adjustments. Today, it is different. Modern industry demands the use of vision under various conditions, often for long periods of concentration on close work.

Providing Eye Protection

Nervous fatigue resulting from exacting visual tasks reduces the worker's capacity to produce, impairs his co-ordination and makes him more likely to injure himself or others. Visual efficiency pays with satisfied as well as efficient workers. The only way the demand for visual safety and efficiency can be met is through a large-scale program of eye care, which will involve the co-operation of employees, employers, eye specialists and union officials.

● **An eye-protection program** should include the following:

1. Education of workers by management in the need for an adequate corrective-protective vision program.
2. Establishment of visual standards for each job.
3. Pre-employment and periodic screening tests of vision to determine those in need of a complete eyesight examination and to aid in job placement.
4. Adequate corrective-protective devices for each worker.
5. Adequate lighting.
6. Rigid enforcement of the corrective-protective program.

With the foregoing contributing to a somewhat fuller understanding of the significance of eye accidents in industry, let us consider what can be done to reduce the frequency with which such injuries occur.

In an effective program for the prevention of eye injuries, three definite questions must be answered:

1. How is the program set up?
2. How is the program put across?
3. How is the program kept put across?

1. Setting Up the Program

Setting up an eye-protection program is largely a matter of salesmanship. It begins with the safety man, and he must be sold without a question on the necessity for eye protection, since there is absolutely no use trying to sell someone something you yourself do not believe in. The next step is to sell management, and this may be done from one or all of the following approaches:

● **Economic**—Comparing costs of compensation for eye losses with the cost of goggles provides a very convincing argument in favor of the latter.

● **Increased Efficiency**—Goggles or plastic eyeshields will instill confidence in the wearer because he realizes that his eyes are safe; therefore, more and better work.

● **Humanitarian**—It has well been said that the eyes are the windows of the soul. Man's sight is his greatest asset. Do you realize that 80% of your actions are guided by your eyes; that 85% of your knowledge comes through them? There is no substitute for an eye. A glass eye is a work of art sometimes hard to distinguish from the real thing—nice to look at, but one cannot see with it.

The output of all glass-eye manufacturers in the United States is not sufficient to meet present demands. Approximately 40,000 artificial eyes are imported annually.

One-eyed men are not generally being hired in industry today and management must certainly assume some responsibility for the welfare of these men so that they will not become public charges.

When management has been sold on the value of an eye-protection program, the next step is to conduct an extensive survey to ascertain the situation and how to maintain the program. The survey should bring out:

1. Type of goggles best suited for general use.
2. Types of goggles required for special jobs such as welding, chipping, dusty operations, etc.
3. The number of prescription goggles needed. If not already done, the eyes of every employee should be examined and those wearing corrective glasses should be immediately supplied with goggles

which contain prescription lenses.

4. The cost. It might be well to give management the estimated cost of the entire plan and arrange for a budget.

2. Putting the Plan Across

There is only one way to do this, namely, by a mandatory rule. There can be no exceptions whatever to that rule.

An eye-protection program can be put across by:

• **Example**—Every supervisor in the mine or outside from the superintendent down must wear goggles every minute while he is on the job. What type of a foreman would ask a miner to wear goggles while exposing himself to danger by not wearing them?

• **Education**—Explain to the worker the value of the human eye. For example, have him close one eye and then attempt to cover his normal field of vision. Total loss of vision is easily demonstrated by having the man close both eyes and walk around a familiar room.

• **Provision for Comfortable Goggles**—Goggles must be comfortable and afford maximum eye protection. It is important that every pair of goggles be properly fitted to the individual wearer. For obvious reasons, this is just as mandatory as a rule pertaining to the wearing of goggles. The best goggle that money can buy is by far the cheapest in the long run.

• **Proper Maintenance by Central Control**—Properly maintaining protective eye equipment is as important as the furnishing of the equipment itself. In the first place, goggles require repairs and adjustments for comfort and maximum protection, and these important features cannot be left to the individual miner.

3. Keeping the Plan Going

If the foregoing is strictly adhered to, an eye-protection program of this kind will practically take care of itself. Of course, firm supervision is vital. Compromise must not be tolerated.

Display boards exhibiting goggles that have saved eyes, together with names of the wearers and an outline of how the accident occurred, have proved beneficial. In maintaining the interest of the workers, suitable bulletins are always helpful. These and a host of other things are useful, but there is no substitute for the mandatory rule.

At first, of course, employees will raise all kinds of objections to the wearing of goggles, but complaints can be successfully overcome by sincere and patient effort. It is simply a matter of education.

• **Handling Complaints**—Complaints against goggles generally run as follows:

1. "They hurt my eyes. They give me a headache." An eye examination will determine whether or not there is defective vision. If so, goggles with prescription lenses should be provided.

2. "They fog up and I can't see through them." A fog-proof solution used on both sides of the lenses and wiped off with a dry cloth will prevent fogging for several hours. Plastic eyeshields which can be attached to safety caps do not fog.

3. "They make me look funny." It is better to look funny with two eyes than pathetic with one.

4. "Side screens obstruct my vision." This objection has no foundation because, for instance, a person crossing tracks does not swing his eyes right or left to see if a trip is coming—he turns his head.

5. "Goggles are heavy." There are 28.35 grams in an ounce. The weight of corrective glasses, 23.1 g, is less than an ounce; weight of spectacle-type goggles is 50 g; weight of goggles with side screens is 53.75 g; weight of cup-type goggles is 70.7; a man's tie weighs 22 g. His hat is five times heavier than his goggles.

While a great deal of difficulty has been experienced in persuading some men with two eyes to wear goggles, I have yet to learn of a case where a man with one eye objected to protecting his remaining window of life.

Coal-Company Experience

• **In 1944 one of the largest anthracite companies** in Pennsylvania, employing approximately 5,000 miners, decided upon a definite safety program to reduce eye accidents. It was found that over 40% of the men required corrective lenses for their safety goggles. In 1943 this company had 259 disabling eye injuries. The total in 1949 was 49—a substantial reduction.

Many mine operators have demonstrated beyond question that goggles are like good production tools. In other words, they will save eyes and cut cost per ton. The number of cents that goggles will clip from cost depends on many factors: the operator's present compensation cost, insurance credit for goggle equipment, etc.

In the Rocky Mountain region a large bituminous company established a complete eye-protection program a number of years ago for all underground and surface employees, no one being permitted underground without goggles. Over a 5-yr period the company showed reduction of 75% in the number of eye injuries and an 84% reduction in eye injuries per million man-hours.

Later, another Rocky Mountain coal producer adopted goggles for all employees. For a 7-yr period after the change the annual number of eye injuries was reduced 76%, and a 78% reduction was effected in the number of eye injuries per million tons. This resulted in reducing compensation costs more than $23,000.

A company in Ohio reduced the frequency of eye injuries 64% by introducing goggles. A company in West Virginia, over a 3-yr period, reduced eye injuries 63% and injuries per million tons 80%. This cut their compensation costs for such injuries 84%.

A bituminous mine in Pennsylvania, requiring all workers to wear safety goggles when they are doing work that might result in eye injuries from flying materials, reduced such lost-time injuries 100%. Another Pennsylvania bituminous operator, over a 3-yr period, reduced eye injuries 90% and injuries per million tons 95%.

• **Defective Vision a Factor**—Recently a mining company in the Province of Ontario, with more than 2,000 men on the payroll, tested the eyesight of all its employees. Here's what they found:

1. More than one-third had defective vision.

2. The vision of approximately 2% of employees was seriously impaired and they did not know it.

What are they doing about it? Well, this company is in the midst of an extensive goggle program at the present time.

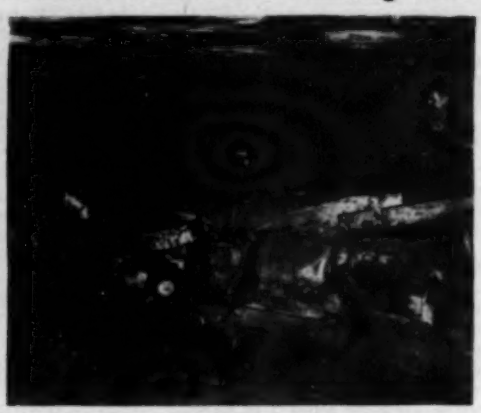
Obviously, this is a step in the right direction, for if a person cannot see well, he cannot be expected to do things as favorably as the one who is not handicapped with poor eyesight.

In conclusion, goggles cost less, in many districts, than the insurance credits they earn, and less for each pair than the most trifling eye injury. In fact, their cost is so low that the finest goggle protection can be given to a thousand men for the cost of one eye made sightless.

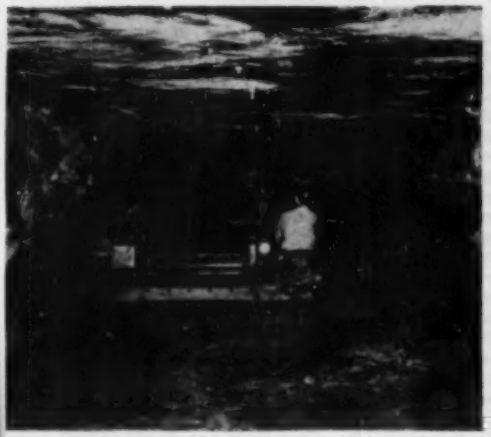
Underground, Modern Machines and Methods Trim Concord Mining Costs

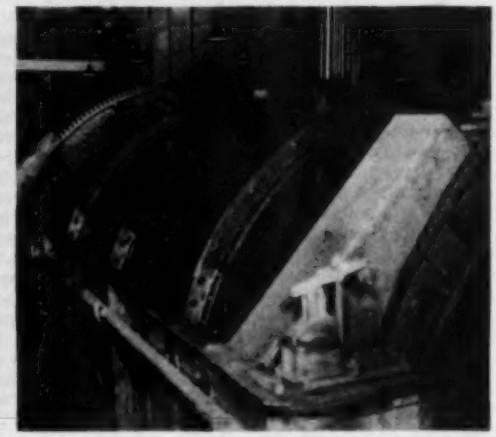


CUTTING MACHINES, rubber-tired, are universal type. Total seam thickness is 93 in. including rock partings.



LOADING MACHINES, crawler-mounted, handle up to 5 tons per minute. Two big fans provide 1,000,000 cfm of air.

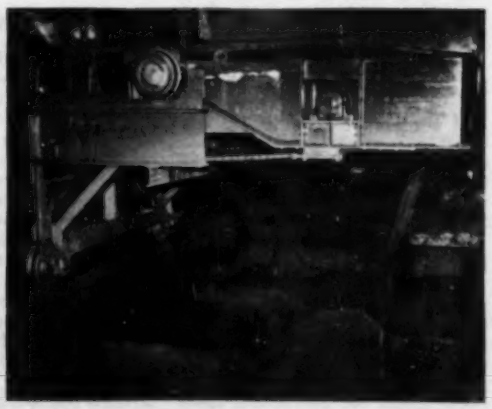




HAULING FROM THE FACE is by shuttle cars, which deliver to mine cars. Mine cars are dumped two at a time in the car dump. Bolts support the roof nearly everywhere, holes being drilled wet to control dust.



BELT CONVEYOR moves raw minus 2-in material from double-deck screen and revolving breaker to blending bins.



BLENDING BINS, in three rows of eight pockets each, are fed by a self-propelled tripper-shuttle unit.



PREPARATION-PLANT EXTERIOR at Concord mine shows slope-belt drive house and buildings for blending, washing and dewatering coal. These, together with underground development and other costs, add up to a multi-million dollar investment.

Complex Materials-Handling Problems Solved at

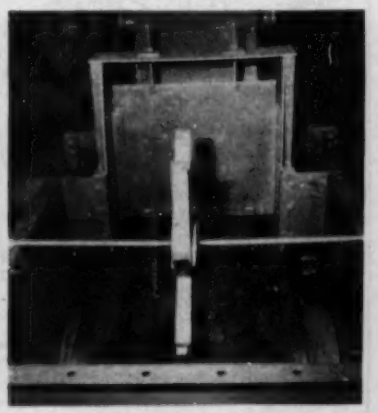
New Concord Mine and Plant

New T. C. I. Mine in Alabama Features . . .

Modern Machines and Methods for Low Cost
Twin Cleaning Circuits for Steady Output
Company-Built Devices for Materials-Handling
Safety and Comfort for Workers

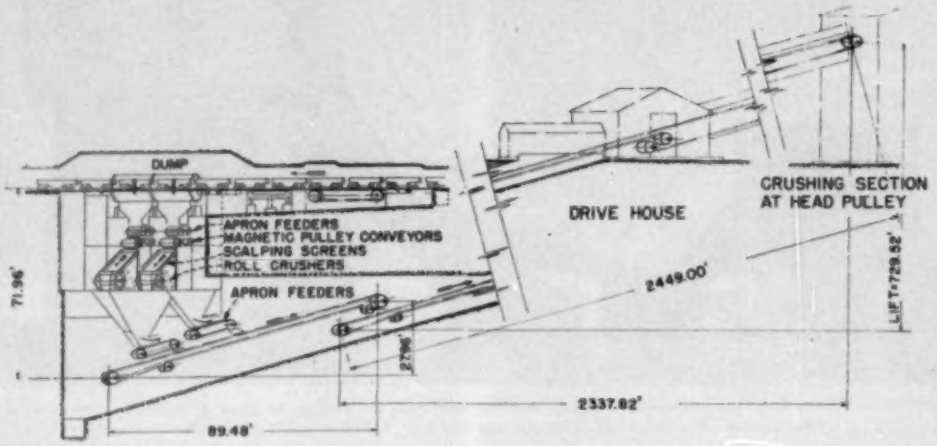
LOW COST, HIGH QUALITY AND SAFETY—these are the goals whether you mine coal to fire boilers, keep homes warm or make steel. That's why operating officials and engineers of Tennessee Coal, Iron & R. R. Co., Birmingham, Ala., planned and developed their new Concord mine as they did.





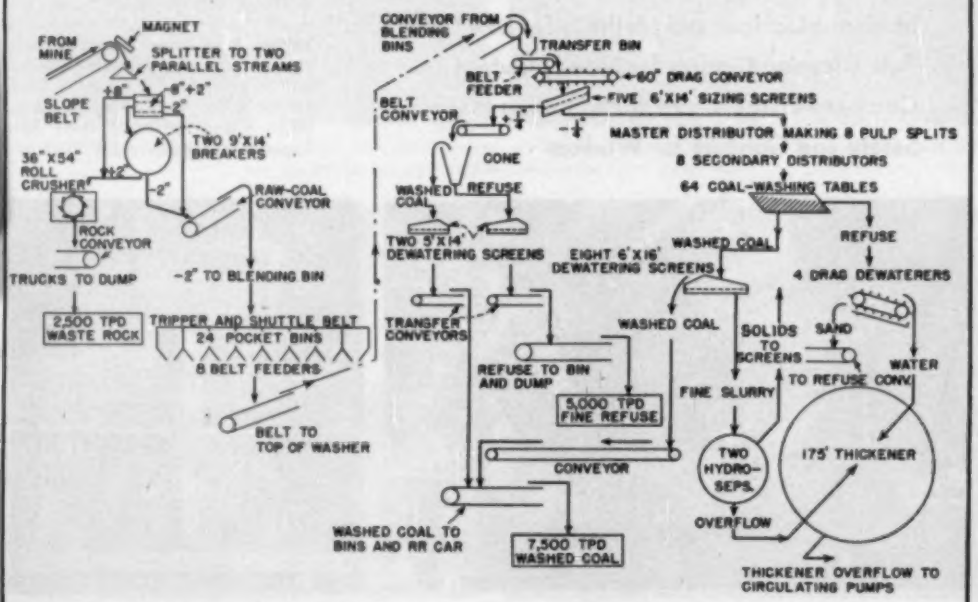
BIN-POCKET DRAW-OFF GATES, air-operated, feed coal from blending bins to eight variable-speed feeder belts, each serving three pockets. Wooden paddle wheel (right) over each belt indicates by its rotation that coal is moving properly from blending bins.

Slope Belt and Underground Loading Station, Concord Mine

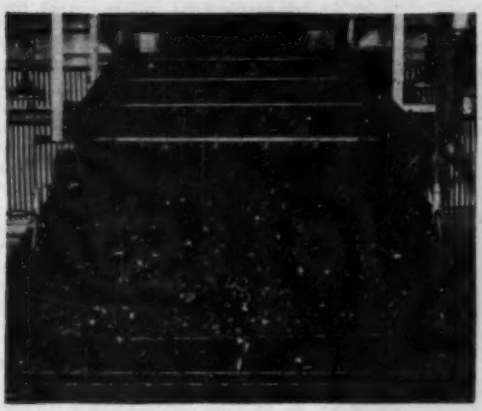


UNDERGROUND DUMP STATION

Cleaning Plant Flowsheet, Showing One of Twin Processing Lines



REPRODUCED BY PERMISSION OF TENNESSEE COAL, IRON & R.R.CO.



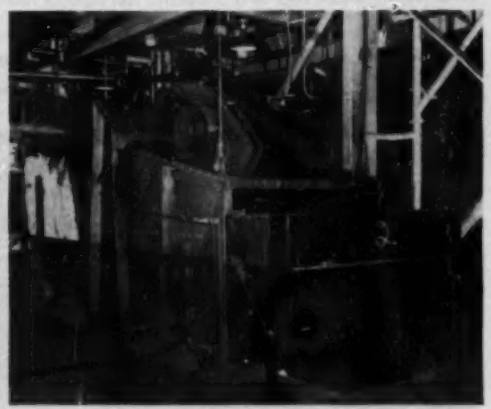
DOUBLE-DECK VIBRATING SCREENS size coal for cone or tables.



PRIMARY DISTRIBUTOR splits pulp for feeding to tables.



CONCENTRATING TABLES produce six parts coal to one of refuse.



VIBRATING SCREENS dewater all of the table-washed coal.

The Concord mine, now nearing the end of development work, soon will produce 7,500 tpd of washed metallurgical coal for rail shipment to coke oven and for use in blast furnaces at nearby Fairfield and Ensley. The multi-million dollar investment in mine and plant facilities is justified by a mine-life expectancy of 20 yr.

Standout features of the new mine and 8-story preparation plant are:

1. Safe, comfortable working conditions for employees, underground and surface.

2. Modern, efficient methods and machines for shaving costs.

3. Primary screening and crushing underground for efficient haulage up the slope belt.

4. A slope belt which, at the time of its installation, was the largest of its kind in terms of horsepower and lift.

5. Ingenious company-designed devices and controls for fast materials-handling.

6. Twin preparation-plant circuits and enough double units to permit on-shift maintenance and insure uninterrupted capacity output of washed coal.

7. Machine and repair shops below and above ground.

8. Special treatment of plant refuse to prevent rock-pile fires.

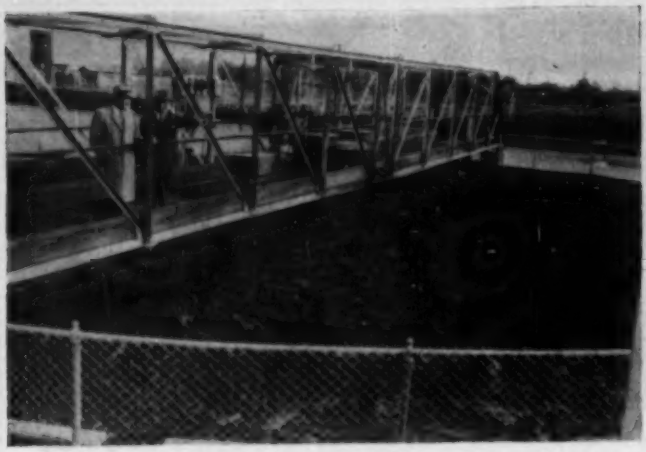
Mining the Coal

The Concord mine works the American seam which, in the local area, comprises 67 in of coal in three benches of 27, 21 and 19 in from top to bottom, with 26 in of rock in two partings—8 in in the top and 18 in in the bottom parting. Total seam height is 93 in.

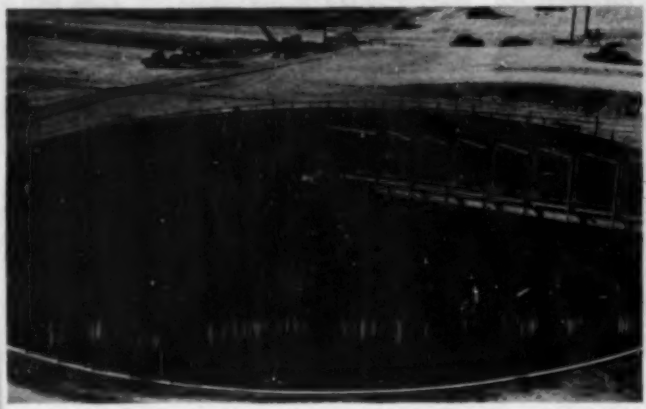
At present, all coal is coming from development work on slopes, headings and aircourses. When panels have advanced far enough, room-and-pillar mining will get under way. A 4-entry system is being used for all development work, entries and aircourses being driven 14 ft wide. The manway-and-material slope, the belt slope and the intake shaft at No. 2 fan station are designed for safety as well as efficient transportation and generous ventilation. All are provided with built-in steps and thus serve also as escapeways.

● **Two fully automatic fans** now are providing about 1,000,000 cfm of air. Each fan is a dual installation, with one side set up for elec-

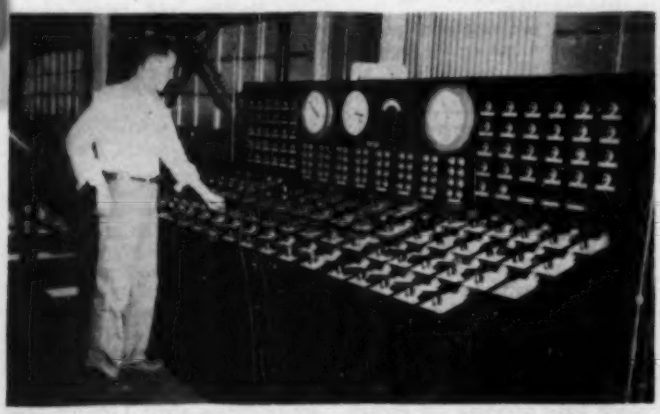
How Concord Gets Uniform High Quality in Metallurgical Coal



TWIN HYDROSEPARATORS, 70 ft in diameter, rake solids for return to dewatering screens. Minus 270-mesh overflows to thickener.



THICKENER TANK, 175 ft in diameter, has natural rock bed. It returns clarified water to plant circuit. It can serve as reservoir for all plant water.



INSIDE THE PLANT, a single panel controls all operations in the parallel processing lines. Either line can handle mine capacity.

tric-motor drive and the other for gasoline-engine drive. If power fails, the gasoline engines automatically pick up the load while a hydraulic system closes the fan door on the motor side and opens the door on the engine side. Restoration of power automatically starts up the electric motor, the doors reverse and the gasoline engines slow down the idling and finally stop. A signal panel at the lamphouse indicates any change in fan operation. The signal panel is supplemented by sound from a horn or siren. Fans and engines are inspected daily and overhauls are made every 6 mo.

Eleven sections now are operating on development work. Later, when full mining operations start up, 11 more sections will be added, making a total of 22 sections working simultaneously. Twelve men now make up a face crew.

Equipment for one section will include a cutter and a loader, or perhaps, in the future, a continuous miner; shuttle cars; and a self-propelled air compressor and air drills for roof bolting. Power conversion is provided by 300-kw mercury arc rectifiers converting current from 2,300 v ac to 280 v dc.

Rubber-tired electric universal cutting machines undercut, topcut and shear the face as may be needed. Permissible explosives are used for shooting. Crawler-mounted loading machines load the shot coal at rates up to 5 tons per minute into rubber-tired shuttle cars equipped with fixed booms. The shuttle cars discharge into elevating conveyors, which in turn load the mine cars.

• **Roof bolts at Concord** provide clear haulageways and working areas for machines and safety for workers. Roof-bolt holes, drilled wet to control dust, are driven on 4-ft centers 4 to 6 ft deep. One-inch split steel rods with steel wedges are driven home by pneumatic stopers and square steel plates are bolted onto the exposed end of the rod with an impact wrench. No top coal is left in place.

Seven-ton 8-wheel steel mine cars with automatic swivel couplings haul the coal from the face loading points to a two-car rotary dump underground. Gathering locomotives are 8-tonners; main-line locomotives, 20-tonners.

• **The two-car rotary dump,** designed and built by T. C. I., is fed by a system of car hauls, also designed and built by the company. The car-haul system comprises two parallel tracks with two cable car feeders, each feeding 15 loads at a

time to the dump car-haul. The dump car-haul, equipped with car stops and a pushbutton control, automatically feeds and centers the cars two at a time through the rotary dump, the trips remaining unbroken because of the swivel couplings. With only two men to operate the system, up to 175 cars per hour run through the dump.

From the dump hopper, which holds up to 75 tons, coal and rock are removed by two 5x8-ft manganese-steel apron feeders traveling 20 fpm. Each apron feeder discharges to a magnetic pulley belt for removal of tramp iron ahead of a scalping screen. The magnetic separators are 5x15 ft and travel 200 fpm. They are equipped with magnetic head pulleys.

The scalping screens are heavy-duty, foundry-type, 5x10-ft single-deckers, with grizzly-type decks. To prevent blinding, the openings taper from 6½ in at the feed end to 7½ in at the discharge end. Two 36x54-in single-roll crushers, operating at 59 rpm, reduce oversize from the scalping screens to minus 8-in.

The crushed oversize and the screen undersize drop into a 60-ton double surge bin. Two heavy-duty apron feeders, 3x8 ft in size and traveling at 60 fpm, remove the raw coal from the surge bin and drop it onto a 42-in buffer belt with 88-ft centers. Sloping slightly more than 17 deg and traveling at 575 fpm, the buffer belt brings the flow of material up to the speed of the main-slope belt.

• **The main-slope belt** at the time it was installed was the largest of its kind in terms of horsepower and lift. Drive is imparted by double pulleys with a 270-deg belt wrap on each pulley. Power for the lower pulley is provided by two 300-hp motors with herringbone speed reducers; for the upper pulley, by one 300-hp motor and reducer. A steel-cable core built into the belt takes care of belt stresses induced by the maximum pull of 80 tons on the head pulley. The belt itself is 42 in wide and slightly under 4,900 ft long on centers of about 2,450 ft. Tension is maintained by a gravity take-up. Total lift is 730 ft on a slope of 17 deg, 21 min. The head pulley is 73 ft above the ground surface.

Cleaning Metallurgical Coal

Suspended over the head pulley of the big slope belt is a rectangular magnet for removing tramp iron that was missed by the underground magnetic-belt separator.

At the head pulley, coal and rock, the run-of-mine product, spill into a separator car which divides the flow into two streams to feed parallel lines of processing equipment in the preparation plant. The separator car, T. C. I.-designed like the car-haul system, comprises a simple splitter chute that divides the stream between the two lines or, when maintenance or repair on one line is needed, diverts the entire stream into the other line. Any breakdown in either line automatically sets the splitter chute to divert the stream to the other line. Each of the two parallel lines can handle tonnage that is close to total mine capacity.

• **In the twin processing lines,** the coal and rock first pass over double-deck heavy-duty 6x12-ft vibrating screens equipped with "non-blinding" grizzly-type top decks with tapered openings for a nominal 8-in separation. Being friable and softer than rock, the coal is reduced to such size as will pass through the screen. Top-deck oversize, therefore, is all rock.

The rock goes to a 36x54-in single-roll crusher operating at 59 rpm. There it is reduced to minus 3-in and delivered to a 36-in conveyor, operating on 261-ft centers at 212 fpm, for transport to the rock bin. The rock from the 150-ton bin is loaded into 22-ton semi-trailers and hauled by tractor for disposal on the dump area. The crushed rock, compacting easily with a minimum of air space when dumped on the refuse pile, does not create a refuse-pile fire hazard.

The bottom-deck vibrating screens, equipped with 2-in square openings, discharge their oversize to revolving breakers. These breakers are 9 ft in diameter and 14 ft long, with 2-in round perforations in the shells. They are without the conventional fins, the grinding action of the rock being enough to reduce the friable coal to minus 2-in. The coal falls through the perforations to a 48-in conveyor, which carries it to the blending bins. The rock is tumbled through the breaker and discharged to the single-roll crusher, described above, from where it passes to the rock-storage bin and is hauled away to the refuse pile.

The transfer conveyor from the vibrating screens and the revolving breakers is 48 in wide, operates on 178-ft centers, and travels 383 fpm. It carries the 2x0-in bottom-deck undersize and the crushed bottom-deck oversize up an 18-deg slope to the blending bins.

• **The blending bins are arranged** in three rows of 8 pockets each, with each pocket subdivided into four vertical compartments. Coal is delivered by a 60-in tripper belt operating on 205-ft centers at 230 fpm. The belt feeds a self-propelled tripper-shuttle unit consisting of a 60-in belt on 24-ft centers. The tripper shuttle receives the 2x0-in raw coal and diverts it to either side for loading any of the bin pockets. In practice, one line of eight pockets is completely filled before any coal is removed from the line, the pockets being filled in order from bottom to top. When one line is filled, a second line is started and coal is removed from the filled line. The blending bins have a nominal capacity of 6,000 tons. About two-thirds of this capacity is available for surge if breakdowns occur.

From the blending bins, coal is delivered through feeder gates mounted below each of the 24 pockets to 8 feeder belts, each of which serves three pockets. These belts, which discharge to the main collector belt, are 30 in wide and operate at variable speed on 43-ft centers. The gates are air operated and are so arranged that only one of the three gates in each set can be opened at one time.

All eight feeder belts must be kept under constant observation to make sure that coal is moving from the gates. To eliminate the steady walking required to watch the belts, a plant employee designed a simple wooden paddle to be mounted over each of the feeder belts. The coal, passing under the paddle, turns the blades so that an observer from any point on the floor can check the movement of coal simply by scanning the eight paddles to see if they are in motion.

The main collector belt from the bins carries the 2x0-in raw coal up a 20-deg slope at 435 fpm to a 25-ton surge bin at the top of the preparation plant. The belt is 54 in wide and operates on 525-ft centers.

From the surge bin, coal is removed by a 72-in feeder belt running at variable speed on 15-ft centers. This belt delivers the coal to a 60-in drag conveyor with flights spaced at 3-ft intervals. The drag scrapes the coal over a series of five

graduated openings, each of which permits coal from different areas of the flight to drop onto a vibrating screen for wet screening.

The five double-deck vibrating screens in each processing line are 6x16 ft with ¾-in square openings in the top deck and 5/16-in square openings in the bottom deck. Each screen has four rows of water sprays. Oversize from both decks recombines and collects in a 42-in-wide conveyor for transport to a cone gravity separator. The screen undersize and water containing 40% solids is conducted to a primary distributor.

● **The gravity separator** is a cone 12 ft in diameter. There, a sand-water medium separates the oversize from the vibrating screen into washed coal and refuse. The average runs about one part of washed coal to two parts of refuse. The sand in the tank is kept in suspension by an agitator equipped with a torque control that automatically opens butterfly valves for refuse removal. Washed coal and refuse are removed from the medium and dewatered by two 5x14-ft horizontal vibrating screens. The washed coal and refuse are delivered to separate 30-in transfer belts and the medium is returned to the circuit.

The undersize pulp from the raw-coal sizing screens flows to a primary distributor, again designed and built by T. C. I. The distributor, 9 ft in diameter and 9 ft high, consists of a revolving top cylinder with seven outlets; three stationary bottom pans with four, five and six compartments; and one bottom pan with seven compartments. The bottom pan will produce seven splits when held stationary, eight when revolved.

Arranged under the distributor are eight flumes fed by swivel spouts from the bottom pan. The primary distributor divides the ¼x0-in pulp into two to eight parts, all parts being quantitative and qualitative equals. The number of splits can be changed without stopping the flow of feed. Each split flows to a secondary distributor for further division into feeds for the individual concentrating tables.

The eight secondary distributors, similar in design to the primary distributors, are 6 ft in diameter and 6 ft high. Here also the number of splits in the flow can be changed without shut-off, but the pulp in the secondary distributors can be subdivided into only seven or eight equal parts, each part feeding a concentrating table. This arrangement permits the operators to remove any one table in a section, or even a complete section, for maintenance.

All together, there are 64 concentrating tables, consisting of eight sections of eight tables each. All tables are 8x16-ft diagonal-deck. They separate the feed into washed coal and refuse.

The refuse from the tables flows to four drag dewatering tanks, each tank serving two table sections. The tables discharge refuse to a 30-in collecting belt conveyor and the water overflow passes to a 175-ft-diameter thickener for further clarification.

The coal-bearing pulp from the tables is dewatered on eight 6x16-ft horizontal vibrating screens with ½-mm stainless-steel cloth, each screen serving a section of eight tables. The dewatered oversize is collected on a conveyor. The fine coal and water slurry pass through the screen and, being split, flow to two hydroseparator tanks.

● **The hydroseparators** are concrete tanks 70 ft in diameter, each equipped with an automatic rake-lifting device. The solids settle and thicken and are raked to the center, from where they are withdrawn and pumped back through a distribution tank to the dewatering screens to serve as a second layer. The first layer of solids on the screen, partly dewatered, serves as a filter bed to trap the fine solids in the second layer. The hydroseparators make a separation of approximately 270 mesh. Materials below that size overflow with the water and go to the 175-ft thickener.

Except for the bottom, which is natural rock bed, the thickener tank is of conventional design and construction. Solids are removed from it by two diaphragm pumps discharging to a centrifugal pump sump. Two variable-speed pumps deliver the sludge to the coal-dewatering screens at about 50% solids as a third layer.

The distribution tank, of T. C. I. design and construction, has eight 4-in outlets controlled by rubber pinch valves. The pulp in the tank is about 45% solids.

The dewatered washed coal from the concentrating tables and from the gravity separator is combined and conveyed to a 300-ton storage bin. From there it is loaded into cars and shipped to the coke works. Preparation-plant dewatering plus drainage of the cars in transit to the coke ovens assures a coke-plant feed of acceptable minimum moisture content. Refuse from the tables and separator is combined and conveyed to another 300-ton storage bin, from which it is hauled to the dumping area.

Controlling the Plant

Clarified water from the thickener is returned to the plant circuit. Fresh water for pump glands, wash-down hoses and spray nozzles provides adequate plant make-up water. A high outside wall on the thickener permits it to serve in emergency as a reservoir for all the water in the plant circuit.

● **Plant control** is maintained by automatic weighing devices on feed and product conveyors, automatic sampling equipment for feed and product, and a central panel, with warning and stop lights for all units. Bin-level indicators and limit-and-pressure switches also are tied into the operating sequence.

A governor or interlock or both are provided for every unit of plant equipment, the operation of which depends on receiving the products from a preceding unit. Thus all equipment must be started in proper sequence. Likewise, stoppage of any unit automatically stops all preceding units and prevents a plant choke-up. Only 27 men are employed in the plant.

All motors are totally enclosed and all electrical equipment is water-tight. This means that all working places can be washed down without stoppage of or damage to any plant unit. Visitors who toured the plant during a recent open-house staged by the company were impressed with its cleanliness and with the absence of dust. White shirts still were white and light suits still were clean when the guests had finished their walk-through.

A modern laboratory, now being completed, will provide a constant check on whether the plant is meeting ash and other specifications, assuring a consistent high-quality coal with uniform ash content down to 5%.

Officials at the Concord mine are as follows: J. E. Neason, superintendent; R. E. Jones, mine foreman; D. A. Cantley, safety inspector; J. C. Shirley, maintenance foreman; P. R. McDonald, superintendent of washers; and J. W. Andrews, washer foreman.



SUPERVISORS IN CONFERENCE study their own problems to arrive at logical solutions based on up-to-date principles of supervision.

By Solidly Backing a Sound Program, Coal Companies Can Secure a Large Measure of the . . .

Benefits of Supervisory Training

▶Training Supervisors TO BE Supervisors Is the Best Way to Weld All Levels of Management Into Effective Unit

▶A Good Start, Sustained Interest and Constant Evaluation of Results Are Top Management's Training Responsibilities

By R. B. HEWES, in Charge of Supervisory Training
Mineral Industries Extension Services, Pennsylvania State College

FROM THE DAYS of the craftsmen's guilds it has been recognized that any man who supervises the work of others needs technical training in the work he is supervising. Industry has long accepted this fact and accordingly has tried to set up qualifications and training courses that will produce men with knowledge of superior skills capable of directing the work of men with supposedly lesser skills.

Such training courses, through time and careful analysis, have been closely fitted to the needs of the men who will take them and to the industry they serve. The analysis has developed a fairly thorough understanding of the results that should be obtained from a course of study that is well planned and closely followed in execution, so that evaluation of these programs has become relatively a simple matter.

● **New Goal Needed**—Within the past quarter century, however, industry has come to recognize the potentialities of training their supervisors to be supervisors, not merely expert craftsmen. Though still not universally accepted, such training has become a major part of the effort of many progressive companies to help their supervisors do their jobs better. Programs of this nature have been in constant operation with some companies for years, with executives and supervisors still highly enthusiastic regarding the results they obtain, and accordingly vociferous in their praise.

Such enthusiasm is bound to be contagious and is worthy of communication to other companies who are experiencing the troubles such programs are purportedly designed to eliminate. There undoubtedly are instances where supervisory training has been undertaken before a thorough understanding was reached on the effort necessary on the part of the company to make such a program effective, on how rapidly and to what extent the desired benefits could be expected to appear and what form these benefits could be expected to take.

In technical courses, when a fact or process has been thoroughly explained to a class, it can be expected that the incidence of trouble arising in the past from a lack of that knowledge should drop appreciably. Raw material and machinery have no memory of past mistakes, so the trouble of yesterday conceivably can be eliminated today through greater knowledge.

• **How the Problem of Supervision Differs**—Training in supervisory techniques is a different matter, however. Not only is it a slower process, but the results of the training will be slower in showing up in performance. As an example of the slowness aspect, one of the basic principles of this type of training is to effect changes in the manner in which the supervisor, as an individual, talks and acts with his men.

The habits he has in this respect are the result of development during his entire life span. He is doing "what comes naturally" because he has been doing it for years, and such habits cannot be altered or eliminated overnight. Even if he has been convinced of the necessity for change through instruction and example—and this in itself takes time—he must also be granted a period of grace to overcome the old habits. During this period he needs constant help, instruction and encouragement to achieve complete success in the alteration process.

Even after this period, more time is needed for the men under this particular supervisor to accept the change. We cannot secure this acceptance immediately simply by notification. It will be evolutionary process during which bad memories can be erased by better ones, new men without firmly fixed opinions will replace older ones, and a gradual easing of tensions can take place without anyone who is not closely observing the change noticing what is happening.

• **Results a Long-Term Matter**—All in all, the ultimate results of such training, properly accepted and conducted on the part of the company, may continue to appear in increasing quantity for years. This statement is, of course, qualified by the assumption that interest on the part of top management and the supervisors is kept at a high level by periodic renewal of the initial program for the same supervisors as a refresher or booster series.

It is questionable, however, if such training would ever have gained a firm foothold anywhere if results did not become evident within a reasonable length of time. It is logical, therefore, to believe that some results do appear readily, and that alertness on the part of top management can identify them as they occur. They will not, of course, be constant in quantity or in the order of their appearance with any two companies, any more than those companies would or should conduct identical training programs.

Marks of a Trained Supervisor

1. He is aware of the responsibility of being part of management and of the human-relations potentialities of his job.
2. He outgrows the concept of doing a day-to-day job and begins to plan his work.
3. He ignores the "dog-eat-dog" attitude in dealing with other supervisors, thus eliminating a major cause of friction.
4. He knows his superiors are willing to give help and advice and he doesn't hesitate to ask when he needs it.
5. He thinks a problem through before attempting a solution and he seldom will be guilty of "thinking backwards."
6. He contributes his valuable views at company meetings when discussion is invited. His thoughts will be marshalled into good order and his presentation will be clear.
7. He is confident of his ability to administer company policy because he has resolved any doubts about it by asking questions to determine the reasons for its adoption.
8. He suggests better ways of doing things because accepted and applied recommendations of his conference group show him that the channel of communication is open for good ideas.
9. He helps reduce costs. Better supervision leads to lower costs, in some form, at some time. The company with alert supervisors consequently should find itself in an excellent competitive position.

What Supervisor Training Offers a Mining Company

Some of the benefits that a company should be able to expect from a supervisory training program are described below. It is not intended to be a comprehensive list, but rather includes those major items that can be used as an evaluation yardstick in observing progress.

1. **A More Acute Realization of Supervisory Responsibilities**—Some of our most persistent obstacles to industrial harmony and efficient operation in mining stem from the failure of many members of management to realize the full extent of their responsibilities. Most supervisors have gained their jobs through good performance on non-management jobs, plus a qualification certificate in certain types of work—and little else. In many instances, the transition from sub-supervisory to supervisory capacity has been so sudden that there is little time for even a "breaking-in" period, and even where this is possible in most instances it simply entails an introduction to the geography of the section and its more notable physical features.

It is only through time and experience that the better candidates become aware of the potentialities that lie in the human-relations side of their jobs, and all too few of them come to that realization through their own initiative. Participation in discussion directed along these lines can and does open a new field of thought and endeavor for these men by showing them how it has benefited others. They

may be subconsciously aware of many of their responsibilities but still will not actually accept them until, by the medium of conclusions arrived at for themselves, they become actively conscious of them.

2. Better Understanding by the Supervisor of His Place in Management—As the supervisor realizes and accepts this new picture of the scope of his responsibilities he necessarily gains a more positive realization that he is, as he must be, a part of the management of his company. This, of course, may be said to work in reverse also—as he attains a firmer understanding of his part in management, he more readily accepts his responsibilities. Either way, he outgrows the concept of doing a day-to-day job and begins planning. His sights become set on the future beyond merely "tomorrow," and he can become an invaluable aid to the foreman and superintendent who will acknowledge his value.

3. Better Cooperative Effort Among Supervisors—It is not uncommon to find that one of the more serious drawbacks to better performance is a "dog-eat-dog" attitude among supervisors. They have seen it practiced among other supervisors from the day they first came into the mines, and they carry it on, and in their turn influencing still more future supervisors. A logical and reasonable result of this discussion and attempted solution of mutual problems is the reduction or elimination of such conditions and the promotion of a cooperative spirit in the daily relationships of those affected.

Of course, it is difficult, if not impossible, to change a person's basic nature. The selfish man will still be selfish, but even this attitude may be exploited profitably if we can but show him that the benefits of working together can be greater than those of non-cooperation. Those cases that refuse to be convinced soon become evident.

4. Greater Readiness to Seek Advice on Supervisory Problems—It is not difficult to recognize the fallacy of any policy that suggests that all supervisors should learn entirely by experience: a sort of "make-your-own-mistakes" attitude. Few companies would knowingly adopt such a policy, feeling that those occupying the ranks above the supervisor should be, and are, willing to provide help and advice where it is needed. However, such requests for aid sometimes are quite infrequent, possibly because of fear on the part of the supervisor that he will be considered incompetent to run his own section.

Unsolicited advice from top management, on the other hand, is tantamount to an order and thus becomes something entirely different in the development of the supervisor. The ability to recognize the need for help and the willingness to seek it from higher authority before it is too late can be an important asset in minimizing our difficulties.

An alert follow-up on the part of top management to the discussions that take place during a supervisory training program will help to develop the belief that the supervisor's superior stands ready to help when necessary. An increase in the frequency of such requests, but still avoiding a dependent attitude, is the surest indication of the development of such confidence.

5. Ability to Analyze a Problem Before Attempting a Solution—The term "thinking backwards" has often been applied to certain types of men. These individuals will leap impulsively at a conclusion without giving adequate consideration to all the elements of the problem. All too frequently the consequences are disastrous. The remedy generally advised is to take more time, but time alone is not the answer. Such men start their thinking wrong, and it is not illogical to assume that they will end up the same way.

Part of the effort of conference groups in supervisory training is directed toward analysis of the supervisor's problems, with the idea of getting him into the habit of problem analysis. It follows that the solution arrived at will, in general, be more successful.

The development of this particular ability should warrant almost any amount of effort in training programs. Men will acquire it in varying degrees, but only the truly exceptional man will become really proficient at it. Others will show lesser achievement, of course, but the average individual should show a marked improvement.

6. Better Participation in Company Meetings—It must be recognized that the company meetings of all officials, whether on a mine or company-wide basis, can hardly be converted into conference meetings. The attendance generally is too large and the agenda too long for everyone to express an opinion. However, even under these conditions, it is desirable to have some participation from the assembly in whatever discussion is invited. The experience gained in his smaller conference group aids the supervisor in marshalling his thoughts into good order for presentation and helps to erase whatever initial embarrassment he may have had.

7. Better Understanding and Agreement With Company Policies—Much of the resentment toward company policy, where such resentment exists, can be traced to a lack of understanding of the reasons behind it. As the most frequent contact between management and labor, the supervisor has a vital need for a clear and complete knowledge of such information. When it has not been fully explained to him at the time of its initiation or development, or when he has entered the company's employ at a later date and thus may be forced to learn it piecemeal, he becomes an ineffective representative and generally resents it.

Introduction or examination of matters of policy by the supervisors in their training conference meetings affords them the opportunity to gain knowledge regarding policy applications and builds confidence in such policy and their ability to administer it. In those instances where the policy suffers by such examination and questioning, it may be advisable for top management to review it themselves.

8. More and Better Suggestions Through Better Communication—It is an old adage that nothing succeeds like success. In a similar vein, it may be expected that when the conference members find that they have been successful in having their recommendations adopted, the company will succeed in getting more and better ideas and recommendations from them in the future. The conference group can be established as the channel for the flow of such information, or it may be diverted gradually to whatever channel is desired. The important thing is to fix in the minds of the supervisors that there is an operative channel.

9. Lower Cost—No matter what other labels we may attach to the improvements that are desired or expected of any training program, there is no escaping the fact that better supervision should lead ultimately to lower cost. What form this may take, or when it may become evident, would be difficult to foretell. However, it is a reasonable expectation that a company whose supervisors have been awakened to their responsibilities and possibilities in the over-all welfare of that company should find itself in an excellent competitive position.

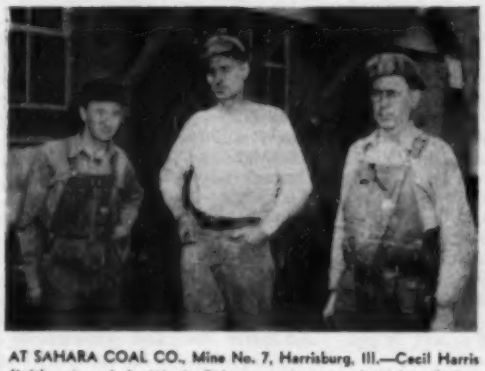


BIG AUGER BUILDERS—C. E. Compton (left), owner and manager, Grafton Coal Co., Clarksburg, W. Va.; M. W. Drummond, mechanical superintendent; F. A. Delli-Gatti Jr., design engineer; and W. J. Higinbotham, welding foreman.

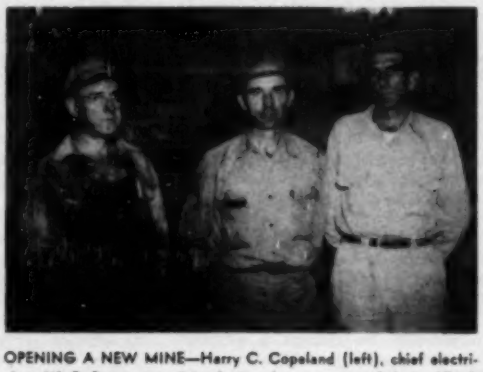


AT GALLOWAY NO. 3 MINE, Simpson Creek Collieries Co., Galloway, W. Va.—G. C. Auvil (left), chief electrician; Joe Mallie, master mechanic; Tom Perry, general superintendent; and J. M. Donnely, preparation manager.

COAL MEN ON THE JOB



AT SAHARA COAL CO., Mine No. 7, Harrisburg, Ill.—Cecil Harris (left), mine clerk; W. J. Calvert, engineer; and Walter Sadler, superintendent.



OPENING A NEW MINE—Harry C. Copeland (left), chief electrician; W. B. Brown, superintendent and co-owner; and J. A. Allred, president and co-owner, A.B.C. Coal Co., Monterey, Tenn.





BOLAIR NO. 1 MINE, Pardee & Curtin Lumber Co., Bolair, W. Va.—Clarence Bell (left), section foreman; S. D. Cogar, foreman of ventilation, track and construction; Frank Rice, section foreman; Hoy Davis, assistant foreman; Elmer Ashey and Edward Mollohan, electricians; and Brooks H. Keener, electrical-controls foreman and co-inventor of the Ensigneer safety control for conveyors.

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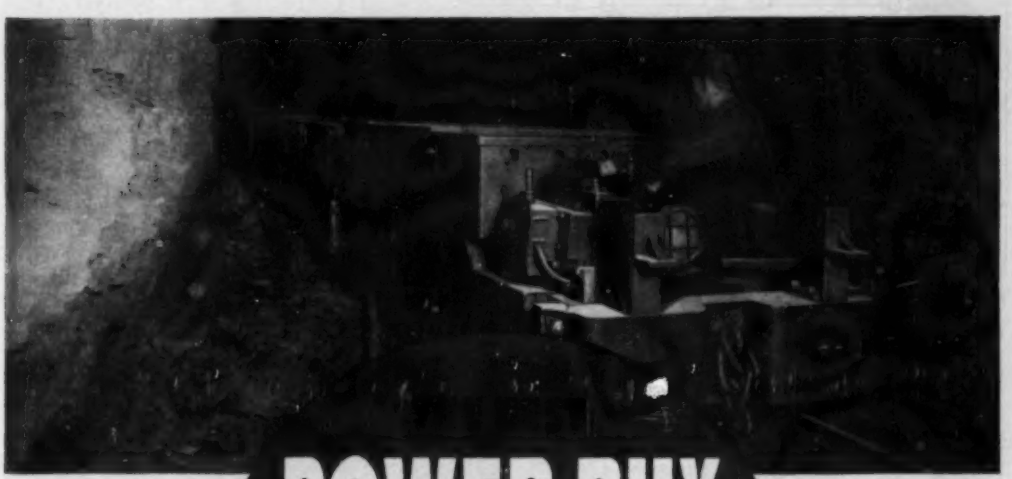
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Operating Ideas

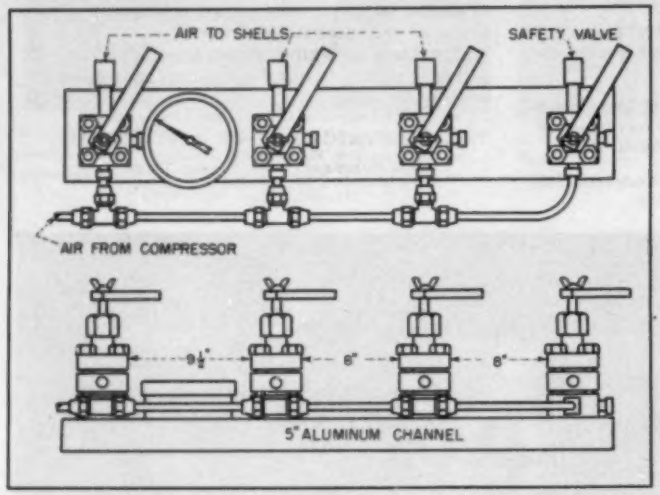


FIG. 1—FOUR-VALVE MANIFOLD for air blasting increases safety and saves time at New Kathleen mine.

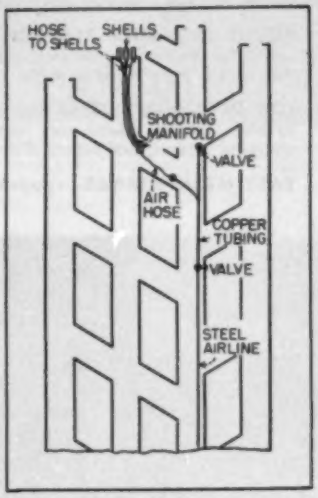


FIG. 2—AIR CONNECTIONS through manifold to shells are made with rubber airhose.

Delay-Type Air Shooting Saves Time and Increases Safety

SEQUENCE-SHOOTING of three Airdox shells is made possible at New Kathleen mine, Union Colliery Co., Du Quoin, Ill., by the use of an air-control manifold designed by A. G. Gossard, general superintendent, according to a letter from Nathaniel Kirk, company safety engineer.

The manifold permits the shotfirer to prime three holes in one visit to the face, after which he retreats to the safety of the face crosscut and fires the shells, one after another, by manipulating three valves on the manifold. Thus, the shotfirer's exposure to face roof between shots is reduced and his time is conserved by eliminating trips to the face after single shots.

As shown in Fig 1, the manifold consists of four valves mounted on a 5-in aluminum channel. Three of the valves serve as connections between shells and airline and the other is a safety valve, if for any reason it becomes necessary to purge the system.

In practice, the shotfirer pulls a small cart carrying the manifold, Airdox shells and rubber airhose into the face crosscut. The special rubber hose, in convenient 25-ft lengths, is used to connect each shell to its own valve and to connect the manifold to the copper tubing of the main airline. After the connections are made the shotfirer fires three holes by opening and closing the three valves in sequence without leaving the safety of the crosscut (Fig. 2).

A gage on the first valve registers the pressure in the system. In 15-ft-wide entries, two shotfirers blast from 250 to 300 holes per day, Mr. Kirk reports.



MANIFOLD ASSEMBLY increases shooting efficiency.

10% MORE WORK FROM CONTINUOUS MINING MACHINES

WITH BATTERY-POWERED SHUTTLE CARS!

95 Time Studies Show Why

Battery-powered shuttle cars have the following advantages demonstrated and proved:

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Only battery cars are "permissible"

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Can produce 10% more tonnage
Deliver more tons per man shift
Give 22% more ton-miles per shuttle car hour

PERFORMANCE
Include all design advances
Travel 25% faster
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Are more dependable and predictable
Handle supplies easier
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Can gob underground
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COST
Equal capital cost
Produce coal in shuttle car sections for approximately ½c less per ton* —in hand-loaded sections, as much as 75c a ton

*Shuttle Car Haulage, AIME, Technical Publication No. 2198.

A "MUST" FOR CONTINUOUS MINING MACHINES

Battery-powered shuttle cars enable continuous mining machines to work 10% more of the shift.

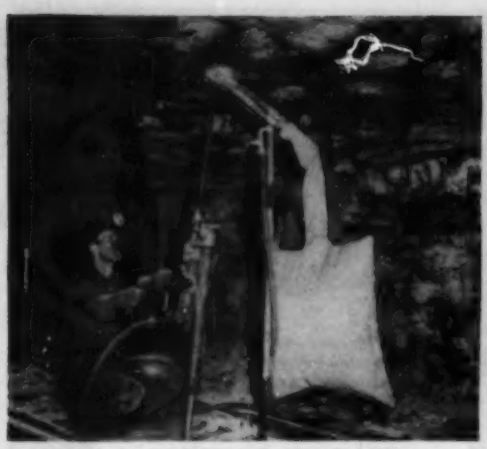
AND . . .

Two-shift operation is now possible with only one set of batteries.

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STORAGE BATTERIES

GOULD-NATIONAL BATTERIES, INC.



NO SIGN OF DUST when new-type dust collector is in actual operation during roof drilling at Price No. 1 mine of the Inland Steel Co.



WITHOUT DUST COLLECTOR—Dust is generated within a few seconds after collector was removed to illustrate effectiveness of unit.

Small Unit Collects Roof-Drill Dust

NEW-TYPE LIGHTWEIGHT DUST COLLECTORS that are comparatively low in cost have solved the dust problem with percussion drilling for roof bolts in the Wheelwright (Ky.) mines of the Inland Steel Co. Two of the units were in regular operation in the Wheelwright mines at the time these operating photographs were taken.

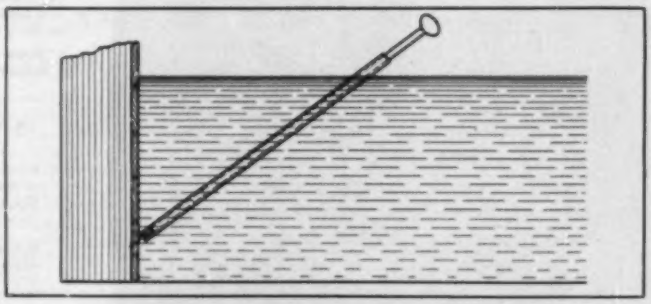
Total weight of the collector is only 20 lb. It consists of a telescoping air leg, a sponge-rubber roof cup, sheet-metal tube and a bag made from heavy ticking. Suction is created by a small air nozzle pointing down the center of the sheet-metal tube. The nozzle is supplied through a small copper tube extending from the top of the air leg and attached to the outside of the tube.

The new-type collectors were purchased from Roscoe Browning, a coal miner of Hampden, W. Va., who developed and built them.

How to Drive Nails Under Water

DRIVING NAILS under water, usually a very difficult task, can be done without trouble with a length of standard ⅛-in pipe for nails whose heads are not more than ⅛-in in diameter, and a piece of rod which slides easily in the pipe. The rod should be 4 to 6-in longer than the pipe and should have a fairly heavy knob attached to its rear end. For larger-sized nails, the pipe and rod sizes may be increased as necessary. Here is the procedure to be followed:

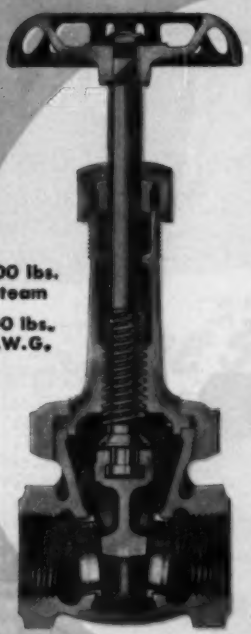
First, put a piece of Scotch tape over that end of the pipe at which the nail will be driven and drop a nail in the upper end, point downward. The nail will slide downward until its point engages the tape, where it will stop. Then, insert the handled rod in the pipe, being careful not to rest it against the head of the nail until the foreward end of the pipe has been spotted at the point where the nail is to be driven. Holding the pipe securely in position with the left hand, manipulate the sliding-rod "hammer" back and forth to drive the nail. The nail will be driven through the tape at the desired location, as shown in the drawing (right). This method also can be used for driving nails in other difficult or inaccessible places.



SO WHAT IF YOU DO HAVE A GOOD IDEA—Why not let COAL AGE tell others about it and help you get a little "credit" beyond your own company? It takes only a couple of minutes to write COAL AGE about the good operating idea, "gadget" or "kink" you've successfully put to work. And remember, we'll gladly pay you $5 or more for each acceptable "idea," on publication. Address: The Editor, COAL AGE, 330 West 42nd St., New York 18, N. Y.



Specify JENKINS for your Best Buy in Bronze Gates



JENKINS FIG. 270-U
Solid Bronze Wedge
and FIG. 270-UN
Nickel Alloy Wedge
Traveling Spindle — Union Bonnet
BRONZE GATES

Monel and Bronze Seating Combination Adds Years of Extra Service Life

In Fig. 270-U, a high quality bronze wedge seats against MONEL rings expanded in the body. With this sensible design, the wear affects only the most accessible part—the bronze wedge—which can be easily replaced by slipping a new one on the stem when necessary. Records in every type of service prove it an excellent combination for lasting economy.

Fig. 270-UN, with a nickel alloy wedge, is recommended for exceptionally severe conditions of rapid wear and corrosion.

The Gates For Your Toughest Services

Made in sizes from ¼" to 2", Fig. 270-U or Fig. 270-UN will provide unequalled economy in any 200 lb. steam, 400 lb. O.W.G. service. Compare performance, especially where conditions are most destructive to valves, as in oil refineries, dye houses, chemical, rubber, and food plants. You'll find there are no other valves like them.

Whatever your need in Bronze Gates, you'll find the right valve for the service in Jenkins complete line. Thirty-five different patterns are available for steam pressures up to 300 lbs., O.W.G. pressures up to 600 lbs. All are built to Jenkins unvarying high standard which makes them the longest-lasting, lowest-upkeep valves that money can buy. Jenkins Bros., 100 Park Ave., New York 17. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

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Form 161-B It describes the Fig. 270-U and other popular Jenkins Bronze Gates or, ask your Jenkins Distributor.

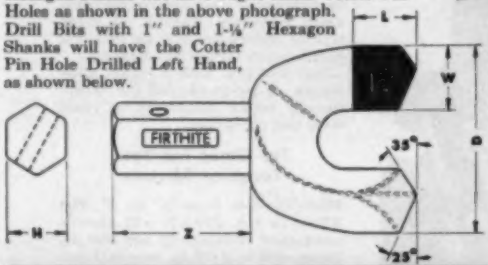


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LOOK FOR THE DIAMOND MARK
VALVES



HEX-SHANK AUGER DRILL BITS

Unless otherwise specified—Drill Bits with 13/16" Hexagon shanks will have Right Hand Cotter Pin Holes as shown in the above photograph. Drill Bits with 1" and 1-⅛" Hexagon Shanks will have the Cotter Pin Hole Drilled Left Hand, as shown below.



DIMENSIONS IN INCHES						
Style No.	Shank Sizes			Tip Sizes		
	D	H	Z	L	W	Thickness
D-2¼-13	2-1/4	13/16	2-1/4	7/8	3/4	5/32
D-2½-13	2-1/2	13/16	2-1/4	1	13/16	5/32
D-2¾-13	2-3/4	13/16	2-1/4	1	7/8	5/32
D-2⅞-16	2-3/4	1	2-1/4	1	7/8	5/32
D-3⅛-16	2-7/8	1	2-1/4	1	13/16	5/32
D-3 -13	3	13/16	2-1/4	1	1	5/32
D-3 -16	3	1	2-1/4	1	1	5/32
D-3 -18	3	1-1/8	3	1	1	5/32
D-3¼-18	3-1/4	1-1/8	3	1	1-3/32	5/32

Full line of SQUARE SHANK Firthite Auger Drill Bits in Auger Diameters ranging from 1¼" to 2¼"

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One driller reported drilling 600—8-foot holes in coal—*"Without a regrind!"*

Faster DRILLING

One three-drill tram drilled 404—8-foot holes *in 7¼ hours* in coal having heavy sulphur streaks!

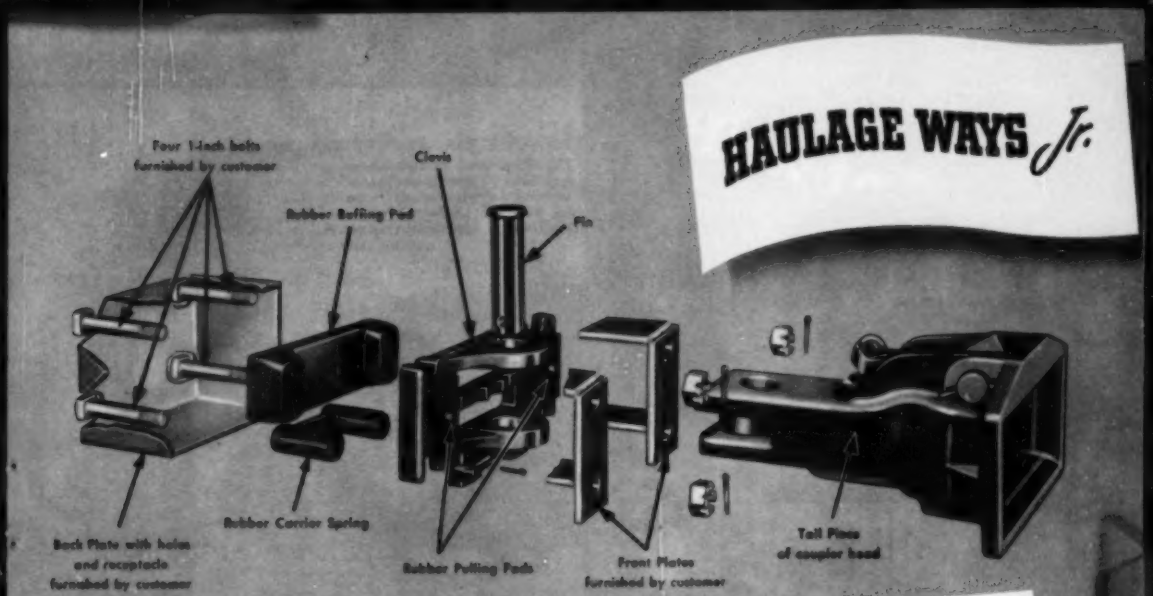
Cheaper DRILLING

A minimum of bit change time requirement—more drilling finished per hour—better and faster drilling *is cheaper drilling.*

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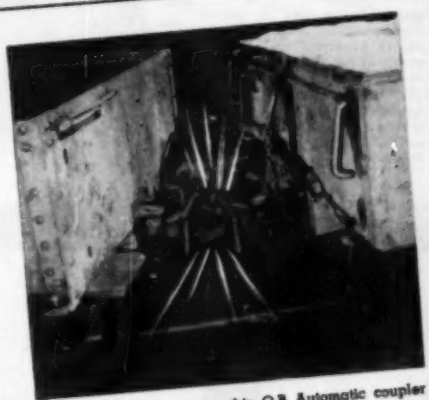


How Can a Coupler BE SO TOUGH?

• How do O-B Couplers stand up to the repeated whacks and jolts encountered in a mine car haulage system? To some, it must seem that any coupler has to give sooner or later, for the punishment is terrific. But O-B Coupler owners know that O-B Couplers won't knuckle down under any sort of rough treatment, and one of the reasons is because of the tough rubber draft gear.

The rubber buffing pad and the rubber pulling pads in the O-B Form-8 Coupler can absorb impacts of as much as 100,000 pounds. These pads, shown in the exploded coupler illustration, occupy less space than steel springs, are more resilient, and are not susceptible to the deteriorating effects that steal the strength of steel springs.

Tough, durable O-B Couplers will improve the operation and maintenance of your haulage system. Less time needed for car handling, safer handling, fewer repairs and longer car life are some of the advantages gained from O-B Automatic Coupling. An O-B engineer is ready to study your system and its needs. Let him help with your planning for improved haulage.



In hard haulage service, this O-B Automatic coupler meets every requirement for strength and utility.

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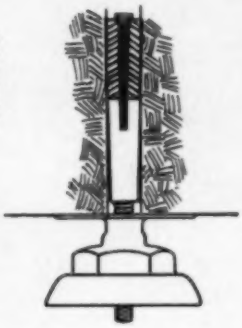
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HAULAGE WAYS *Jr.*

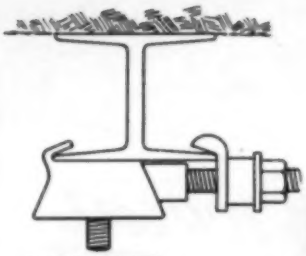
ROOF-TYPE HANGERS

The Universal-2 Hanger shown and several like it can be attached directly to the roof, or can be attached to the timber by means of a mine hanger screw.

Cat. No. 11807







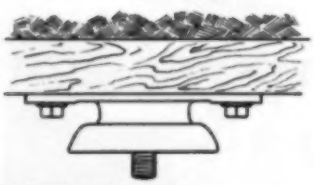
I-BEAM HANGERS

Here's a good way to put a hanger on an I-beam. The hanger shell is provided with an adjustable clamp which hooks over and tightens onto the flanges. O-B Insulated I-Beam Hangers are made for flange widths ranging from 3 inches to 13½ inches.

3 to 5 in. flange .... Cat. No. 15391
5 to 8 in. flange .... Cat. No. 15803
8 to 13½ in. flange . Cat. No. 20551







TIMBER-TYPE HANGERS

A couple of lag screws hold the Type-H hanger onto the timber. Side-mounting hangers for low-vein mines and other locations where headroom is limited are available also.

Cat. No. 11553





PIPE-TYPE HANGERS

Easy to keep the trolley wire level when you have the materials! O-B makes the bracket and the hangers needed for this installation. An O-B Type-U Hanger is shown.

Cat. No. 12995

How to Hang a Wire Anywhere



ROOF BOLT HANGERS

This is one for roof bolters. A Type K-3 Hanger with a ¾-inch tapped boss attaches directly to the protruding end of the ¾-inch threaded rod. The roof bolt is held with an O-B Roof Support Expansion Shell and Plug.

Cat. No. 22015



POLE BRACKET HANGER

Fasten the Type-N Swivel Pole Bracket Hanger to a pipe extending from the rib. Use it on the outside on O-B Rigid Pole Brackets.

1½ in. pipe diam. . . . Cat. No. 9828
2 in. pipe diam. . . . . Cat. No. 9834



No matter how your mine roof is supported, there's an O-B method for attaching hangers either to the support or, if you wish, to the roof. Some are shown here. For each method there are several O-B hangers or combinations of hangers and accessories, one of which will make hanger attachment a simple matter in your mine.

O-B hangers consist of a metal stud bolt held in a metal supporting shell by molded insulation. Electrical and mechanical tests before shipment give assurance that each hanger will withstand rigorous use in mine service.

In the O-B Mining Catalog you will find a wide selection of hangers. From this listing you can select a small group of hangers and accessories for use anywhere throughout your mine. Simplify your trolley installation, and your stock-keeping, with standard O-B hangers.

Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

HAULAGE WAYS *Jr.*

FORGET ABOUT CABLE PULL-OUTS

O-B Terminals are the Strongest Available for Use in Fused Taps

Fastening cable about a binding post may make a good connection for a fused tap, but it takes time. It's a fussy job to form a loop in heavy cable and hold it in place while the post is being tightened. While it will hold most of the time, it just isn't as strong as a fused tap cable connection can be, and those 'once-in-a-while' pull-outs usually tie up a lot of production.

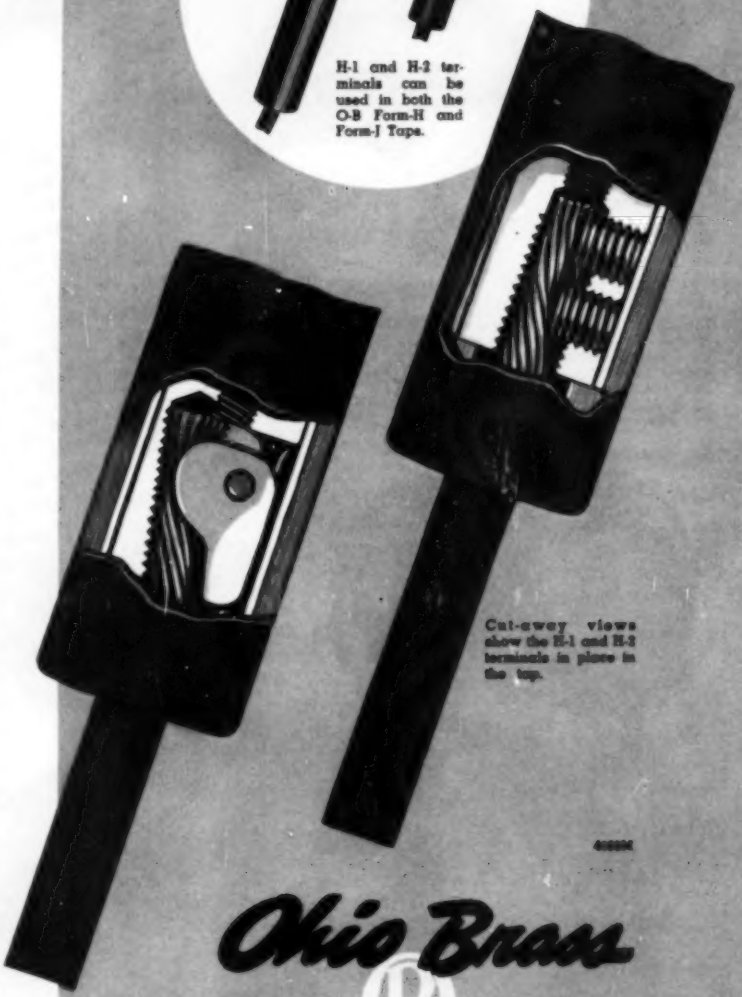
Why not simplify matters with a fused tap terminal that really holds on? The O-B Form-H and Form-J Taps have the strongest cable-gripping terminals available for use in fused taps.

The set screw type H-1 terminal and the cam type H-2 terminal cover a range of cable sizes from No. 6 to No. 2/0, and both can hold tight enough to break the cable rather than let it slip. Fastening the cable to either is an easy job—just slide the bare cable end into the terminal hole and tighten the set screws or hammer the cam into position. Whichever you use, you've got a cable connection that will stay put!

Get away from pullouts and production delays with O-B Form-H and Form-J Taps. They really hold on! Your O-B representative has these taps ready to show you.



H-1 and H-2 terminals can be used in both the O-B Form-H and Form-J Taps.



Cut-away views show the H-1 and H-2 terminals in place in the tap.

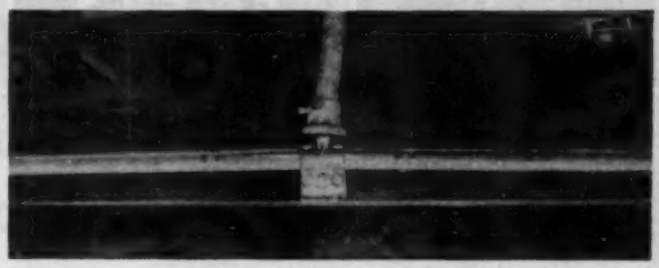
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CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Signal Cable Clamped Along Bare Feeder

AN UNUSUAL METHOD for supporting track signal cables that is both cheap and effective is used along the new 6-mi haulageway connecting the Wheelwright mines with Price No. 1 mine of the Inland Steel Co., Wheelwright, Ky. Copper cable hangers designed for hanging large lead-covered telephone cables from small steel messenger wires have been given an altogether different role. In this haulageway, they are used to support a small insulated signal cable installed over a bare 1,000,000-circ mil feeder cable.



The 600-v neoprene insulation of the signal cable is thought to provide ample protection from the 275-v bare feeder to which the cable is attached. Potential between the feeder and the signal cable conductors is not necessarily 275 v, however, because the signals are powered from the trolley system. The clamps were selected from Graybar Catalog No. 11-s.

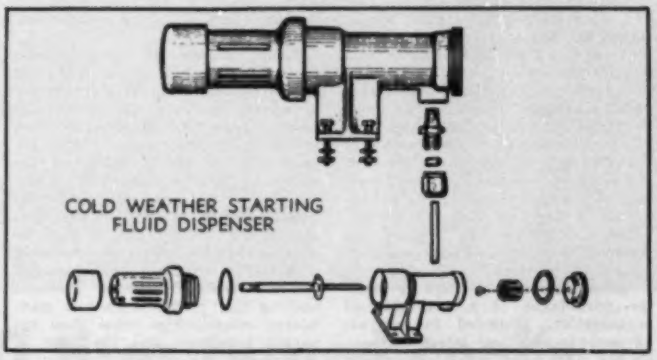
The signal cable is placed on the top of the feeder where it cannot be hit by the locomotive trolleys. This method of signal-cable support saved considerable money and offers better protection than separate mounting.

How to Operate a Tractor Cold-Weather Starting System

EXPERIENCE has shown that regardless of temperatures a tractor can be started by the following method if the starter will turn the engine over, even at very low cranking speeds, reports *Timber Topics*, published by the Allis-Chalmers Tractor Div.

This cold-weather starting system consists of starting fluid in two sizes (7 and 17 *cc*), a dispenser assembly which punctures the capsules, and a pump to force the fluid through a small nozzle into an air inlet near the blower.

The vaporized starting fluid, blown into the cylinders by the blower, is ignited by compression. The fluid is essentially ethyl ether which has a low ignition temperature, promoting quick engine starts at temperatures from 50 deg above to 50 deg F below zero.



How to Operate the System

1. Unscrew the upper chamber of the dispenser.

2. Place a capsule of fluid, small or large, depending on the air temperature and requirements established by trial, in the lower chamber, or body, of the dispenser. In extremely low temperatures, one large and one small capsule may be necessary.

3. Pull the plunger to the top of the upper chamber and screw it tightly into the body.

4. Push the plunger to the bottom, thus puncturing the capsule(s) and releasing the fluid so that it can be picked up by the primer pump.

5. Push the engine shutoff knob all the way (operating position) and pull the throttle wide open.

6. Depress the starter pedal to crank the engine and at the same time use the primer pump to pump fluid into the air system until the engine starts and runs normally on regular fuel. Use capsule(s) only of the size required to start the engine and pump until all the fluid has been injected into the engine.

7. While the engine is warming up, again unscrew the upper chamber and remove the empty capsule.

8. Again screw the upper chamber tightly into the body.

Maintenance Suggestions

If the engine is cranked with the throttle wide open and does not start after two or three strokes of the primer pump, it is advisable to inspect the system for causes of failure.

1. A partially clogged primer elbow assembly will prevent delivery of the starting fluid.

2. Failure of the primer pump to function may result from worn or damaged packing rings, a clogged dispenser screen, clogged fluid lines or "frozen" or worn check-valve balls.

3. A clogged dispenser strainer will prevent fluid from reaching the pump. The strainer is bolted to the plug and screened into the bottom of the dispenser body. To clean the strainer, unscrew the strainer plug from the body and wash both in hot water. The body may be washed without removing it from the cowl by removing the upper chamber, the connector and the strainer plug.

Precautions to Be Followed

The starting fluid is highly inflammable and should be treated with the same caution as high-octane gasoline. Gelatine capsules dissolve in water and soften at high temperatures.

Avoid:

1. Breathing large quantities of fumes from the fluid.

2. Cutting hands on barbs of the puncturing plunger.

3. Bringing fluid and capsules near open flames, sparks or hot surfaces.

4. Getting capsules in contact with water.

5. Subjecting capsules to high temperatures (above approximately 120 deg F).



The Foreman's Role in Labor Relations

By A. J. BARTLETT, Personnel Director
Pond Creek Pocahontas Co., Salyersville, Ky

JUST AS HARSH and arbitrary supervision figured prominently in the growth of unionization, it is equally significant as a cause of trouble in the day-to-day administration of the contract. But an even more deep-seated source of difficulty is a lack of training, information and backing, and this worries the foreman, who is trying his best to get along with the union and be a good boss and an able administrator.

The entry of unionism into coal mines and other industries has numbered the days of arbitrary and driving foremanship, with the result that the foreman in the lower level of management who would succeed must now be a leader rather than a driver. As one writer has expressed it, "collective bargaining has changed the foreman from an absolute to a constitutional monarch."

Labor leaders were quick to grasp the advantages of a well-informed organization, grounded in contract agreements and their interpretations. On the other hand, lack of knowledge of contract agreements and their interpretations is the source of much embarrassment to the foreman, especially when he knows that his subordinates or workers are better informed. Such lack of knowledge and information is not conducive to good labor relations.

Let us look at the position of foremen in unionized industry. They often find themselves the focus of several opposing forces, especially if the union leadership is militant. In the first place, as a nominal member of management the foreman is expected to follow certain top management policies and to do particular things which in many instances he considers to be unwise or impossible of fulfillment. In the second place, he is in daily contact with his workers, and it is quite possible he cannot avoid being influenced by their sentiments, beliefs and culture. These sentiments and beliefs are not infrequently opposed to the colder logic of top management, which is often communicated to him by some aloof and remote management representative. Finally, the foreman must deal with local union officials and committeemen, who may be subject to his work orders. To say the least, the foreman's job is a tough assignment.

Many progressive managements realize the importance and difficulty of the foreman's job and are trying to correct the evils of the past by providing the foreman with the tools and skills necessary to do a good job of day-to-day administration of the contract. This requires tact, diplomacy, objective fact-finding and emotional balance. If the foreman is to assume this difficult job, he must be assured that his supervisors not only approve, but also give him day-to-day and hour-to-hour backing. There is nothing that invites disdain in man-to-man relationships more than apparent indecision and the type of evasiveness which takes refuge in lack of authority.

When top management recognizes that the foreman is the key man in establishing good labor relations, they should make him feel he is a definite part of management by giving him assistance in the way of information and training, helping him to study the contract agreements, and letting him know what management's interpretations are with respect to the contractual rights of management and rights of the worker.

Periodic meetings should be held among foremen and representatives of top management who are in position to discuss contract agreements and their interpretations. At these meetings, the foreman should be urged to present any problem in labor relations he may be having in his day-to-day contacts with his workers, and management's representative should be in position to give him the right answer on the spot. If the problem requires further consultation and a decision of top management, the foreman should get his answer as soon as the decision is rendered.

Developing good labor relations depends in large measure upon the foreman in the lower level of management. This is particularly true in avoiding and properly handling grievances. Management may surround itself with the best labor-relations policies attainable, but if they are not properly administered by the foreman they will be of no avail. Thus, there is every necessity for training and educating the foreman in human and labor relations.

How well a foreman knows the people he supervises and how well he gets along with them is of great importance, particularly in avoiding and handling grievances. In most labor contract agreements, the first step in procedure is the presentation of the grievance by the worker to his foreman. If the foreman has been properly equipped with knowledge of the contract agreement, company policy and practice, many of the grievances can be settled at that point. Where the foreman is not equipped with such knowledge, most grievances have to go past him for settlement. Therefore, through proper handling of grievances, the trained and informed foreman can save the time of middle and top management and in many instances avoid work stoppages which are costly in both money and morale.

The foreman must clearly understand what a grievance is. Anything about a man's job that irritates him or tends to make his working conditions unsatisfactory may be a grievance. A grievance may be trivial or important, affecting an individual or a group, caused by fellow-workers or management, imaginary or real, but it is a grievance in any case, and requires fair, open-minded, patient, considerate treatment.

The foreman is in the key position and is the proper person to hear and take action on grievances. As the workers' immediate supervisor, he is in the best position to judge the validity of a grievance. It will establish better feeling between the worker and the foreman if the latter takes care of the worker's complaint without making it necessary for the worker to take his grievance higher.

(*Continued on p* 100)

Abstract of a paper entitled "Labor-Management Relations and the Foreman," presented at the 1950 meeting of the Kentucky Mining Institute.

B.F.Goodrich



How BFG tires turned coal's top inch from dust to clean profit!

STRIP miners know that cleaning the coal seam after the stripping shovel has finished its job is often a dirty and wasteful operation. Before small shovels can begin removing the coal, the common practice has been to doze away the dirt left by the big shovel with crawler-type tractors. But the steel tracks of such equipment chew up the top inch of coal. This coal, in turn, blows about — leaving a black badge on men, machinery and equipment that represents lost profit.

Here's how the collieries operating the mine shown above turned this top inch of coal into clean profit. The light tractor, equipped with B. F. Goodrich Tractor-Grader Lug Type tires, replaced the heavy dozer. Because these tires have a tread especially designed to give super traction even when working under light equipment, the job was done faster and cleaner . . . without the waste of the top inch of coal. In addition, the superintendent reports that this fast-moving unit makes it possible to work right up next to the huge shovel bucket — saving time, and that means profit.

This is a small, but interesting example of how B. F. Goodrich gives greater service to operators of off-the-road equipment. BFG offers a special tread design for every job to be done. Only BFG has the patented *nylon shock shield*, the exclusive plus factor that practically eliminates bruise breaks that result in time loss and costly replacement. A layer of nylon cord is built in between the tread and body plies to shield the cord body. In tires for heavier service, there is a *double nylon shock shield* to smoothly distribute impacts and strains.

Next time you buy tires, see your B. F. Goodrich dealer. Specify B. F. Goodrich tires for your new equipment and enjoy the profits of longer service and greater traction. *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

How Competent Bosses Can Knit Labor-and-Management Interests

Since every grievance arises from some condition or circumstance which irritates a worker, it is the foreman's job to get rid of irritations. The principle that "an ounce of prevention is worth a pound of cure" applies with full force to the handling of grievances.

The foreman must adopt "the open door policy." Nothing aggravates a worker's grievance more than the feeling that his foreman is hostile to the idea of listening to complaints. He should make it known by word and action that he welcomes the presentation of a complaint, rather than have a worker nurse a grievance in disgruntled silence. It is not enough for the foreman to say he welcomes frank and honest complaints; he must prove by the interest he shows in correcting complaints that he is sincere in his "open door" policy.

When confronted with a grievance the foreman should do everything possible to put the worker at ease by making him feel that he has a perfect right to express himself frankly, by indicating a willingness to take all the time necessary to discuss his complaint and by manifesting a readiness to give open-minded consideration to what he has to say.

The sincerity with which a foreman listens to a worker's grievance is of utmost importance in achieving a "meeting of minds." The importance of any grievance, even though it may seem trivial to the foreman, is such to the worker that no competent foreman who listens to it can afford to show less than a sincere interest in all the facts, assertions and opinions involved.

Many foremen make the mistake of becoming involved in an argument when confronted with a grievance. An argument only tends to convince each party that he himself is right and the other is wrong. A foreman allowing himself to be drawn into an argument suffers loss of poise, dignity and self-respect, and is likely to put the grievance on a personal basis rather than on a basis of facts.

The competent foreman in dealing with a worker and his grievance knows the situation must be kept on a discussion basis. No one wins in an argument. Calm discussion permits of settlement by reason rather than by emotion, threat, or resort to show of authority; and no settlement on the latter grounds is likely to be lasting or mutually satisfactory.

When a grievance is presented, it is very important that the foreman get the story absolutely straight. In seeking all the facts, he should proceed tactfully with the stated purpose of arriving at a fair decision, rather than with an attitude of suspicion and apparent disbelief of statements of the aggrieved party. While promptness in handling a grievance is important, plenty of time should be taken in getting all necessary information and an accurate description of the situation in order to arrive at an intelligent decision.

To be successful in handling a grievance, the foreman must show a thorough appreciation and understanding of the viewpoint of the worker. A sincere interest in getting the worker's viewpoint will convince him of the foreman's desire to be fair, which is the first essential in any equitable and harmonious settlement of a difference between people.

The use of "snap judgment" should be avoided in dealing with a worker and his grievance. It involves the danger of making a mistake and also the danger of creating the impression the foreman has a closed mind or a careless attitude toward the worker's problem. Mistakes made from snap judgment undermine the foreman's prestige and reputation for fair dealing.

Some of the greatest errors in handling grievances are made because foremen are unwilling to admit their own mistakes. Frankly admitting a mistake never injures a foreman's prestige as much as covering up a mistake or refusing to admit having made one. Refusal to admit a mistake leads an aggrieved worker to increase his demands, even to the point of unreasonableness, because of the obvious unfairness of the foreman who is not big enough to "take it" when he has it coming.

"Buck passing" in the handling of grievances creates more embarrassing problems than it cures. It makes the worker feel he is being given the "old run around." If a foreman does not have authority to settle a grievance, he should not put the worker to further inconvenience. He should frankly state he does not have the authority, but that he will get a decision from the person who does have the authority.

Not all grievances and requests are justified, so quite often the foreman's answer to complaints must be "NO." To "pussyfoot" and "straddle the fence" will only make more trouble in the end. There is a right way and a wrong way to say "NO." Unfortunately many foremen say "no" too abruptly, without giving clear evidence they are giving the worker's complaint, thoughtful, fair and complete consideration.

One of the gravest errors a foreman can make is to make a show of authority. Even though he may have authority to render a decision, authority wielded as a club begets disrespect, antagonism and opposition, while authority used judiciously and temperately heightens respect and cooperation.

So far we have considered some things a foreman can do at work to effect good labor relations. Frequently, however, his off-the-job interests have a decided bearing on the intelligence he brings to his job, and with which he handles his labor problems.

The foreman who has no broadening interest in life cannot serve his company and know how to deal with people as well as one who has a vital interest in all things that go to make up life in our modern times. Leadership experience in community activities will make him a better leader on the job.

A foreman is the logical person to take a certain amount of leadership in his community. His experience as a leader on the job should qualify him for effective leadership in his neighborhood. Because of the influential position he holds among workers, the foreman is expected to be broadminded in his off-the-property interests.

A good foreman exercises leadership, not only in directing specific work, but also in helping the people at the work level with personal problems. The broader the foreman's viewpoint is on many matters, the more intelligently he can act as a leader of the people he supervises. Workers expect their foreman to be a well informed citizen. Therefore, it behooves the foreman to broaden his interests in order that he may stand before the worker as an all-around leader.

When a foreman has gained the confidence of his workers as a leader, he is in excellent position to influence them soundly on the basic facts of good relations.

There are several things a foreman should do in playing his appropriate part in life of the community.

His personal conduct should be such as to reflect credit rather than discredit upon himself and his company.

He should play the part of a good citizen in all that this implies.

His conduct off the job should be such as to command the respect of his men on the job.

He should conscientiously refrain from activities or conduct which may embarrass and unfavorably affect his and his company's reputation.

Both labor and management want the same thing—a satisfying day-to-day administration of labor problems. The use of common sense and a realistic adjustment of minor problems which irritate the worker are of great significance in building good labor relations.

Since top management generally agrees that the foreman is the key to maintaining good labor relations, it is top management's responsibility to give the foreman all its support by training him to do the job that is expected of him. We must not close this subject without stressing the necessity for the foreman to acquire by training in simple economics the broad picture of how both he and his workers fit into the operation of their company.

MACKS make light of heavy loads . . .

Big Mack super-duty trucks make the hard jobs look easy . . . because in design and construction they incorporate numerous outstanding features that contribute to easy maneuverability, ease of control and positive traction regardless of terrain.

Powerful Diesel Engines! Hydraulic Power Steering! Air Assist Clutch! Flexible Rubber Shock Insulators! Mack's famed Balanced Bogie and Power Divider. All are Mack features that assure power and strength for the heaviest loads; flotation and traction for the most slippery mud or sand.

Your nearest Mack branch or distributor will give you the full story on what Macks can do for you in trouble-free, uninterrupted schedules . . . greater profits through greater output at lower cost. You'll find it's a story well worth hearing.



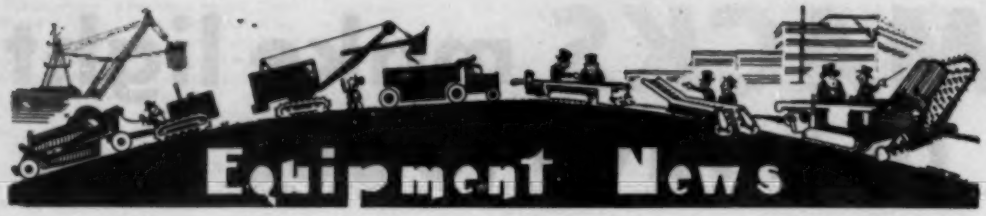
Only Mack gives you all the advantages of the famed Balanced Bogie. Positive traction because of exclusive Power Divider. No spring twist because of Mack Rubber Shock Insulators. Inherent flexibility eliminates chassis distortion. Extended tire life because of uniform tire loading. Minimum maintenance because of simplicity of design.

Mack TRUCKS

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Road-and-Track Unit Speeds Railway-Car Handling (1)

Unusual versatility and efficiency in hauling, spotting and switching railway cars are reported by the Whiting Corp. for its newly announced compact gasoline-powered Trackmobile, which can travel either on the railway track or on the ground and can change from one to the other in 30 sec. The 6,000-lb Trackmobile couples to any standard railway car, its hydraulic jack raising the special Whiting coupler and forcing the unit down on the track so that a portion of the car's weight is thus transferred onto the Trackmobile. As a result the Trackmobile is able to develop a maximum draw-bar pull of 7,350 lb, sufficient to easily handle loaded cars, the maker says. When operating on track, the four rubber-tired wheels for ground travel are hydraulically retracted. Maximum ground speed is 25 mph, with track speed varying with the load. Bulletin TM101 offers full details. Circle No. 1 on card facing p 112.—*Whiting Corp., Harvey, Ill.*



Self-Tramming Unit Drills and Bolts Roof (2)

Newly announced Baker-Fletcher hydraulically operated roof drill and wrench is powered from a trailing cable and is said to provide drilling speeds up to 10 fpm. Designed for water drilling, the unit features an automatic feed control, and thus requires no particular skill in operation. The drill will not stall, the maker says, and since drilling, bolt insertion and wrenching are through the same center, all work remains in line. A single explosion-tested motor with step starter supplies power for all hydraulic functions, with hydraulic power providing smooth tramming control to permit wide variations of speed with constant torque, it is said. A hydraulic tilt of 45 deg to either side simplifies angle boring and the unit features a telescopng lift that gives a rigid guide for long feed. The machine is available in two styles: one 59 in high, with a 66-in drill travel, and the other 50 in high and a 42-in drill travel.—*Baker-Raulang Co., Cleveland 2, Ohio, or J. H. Fletcher, Huntington, W. Va.*

No Matter What Your Job . . .

YOU'LL FIND some of the 57 new products and catalogs described in this section worth investigating. So as you check over these pages, note the numbers of the items that interest you. Then fill out the postage-free card facing p 112 and mail it to COAL AGE. We'll pass your request on to the manufacturers. No obligation involved.

Bit Cost .1 Cent Per Ton, No. 9 Seam, Ky.

A Union County, Kentucky mine has, for several years, averaged 6,000 tons of drilling per bit in the No. 9 Seam by using Kennametal D-1¾" Bits. Bit cost is 1 mill per ton, their lowest on record.

•

Bit Drills 24,150 feet in Sewell Seam, W. Va.

A mine in Fayette Co., W. Va., reports 690 times longer service than with steel bits by using the Kennametal D-1¾. At a footage of 24,150 feet the bit had been reground 6 times and operators calculate that the bit will be reground at least 6 more times.

•

Kennametal Bits Increase Service Life 4 Times Over Other Carbide

According to a Superintendent in Westmoreland Co., Pa., one Kennametal D-2½ and one other carbide bit of the same size were tested together. Performance—Other carbide: 36 feet, dull at that point. Kennametal carbide: 144 feet before dulling. Conditions of the test were identical, down to the same drill operator.

•

Rotary Bits Offer Low Cost Rock Drilling



A new rotary bit of unusual design and drilling stamina is now available for drilling roof of slate, shale, and laminated sandstone. It has two thick blades of Kennametal carbide that give exceptionally high resistance to wear. Special features are: (1) Smoother hole without rifling, (2) Longer gage life in hard roof, (3) Easy bit sharpening, (4) Lower bit cost than obtainable with any other bit used for drilling medium hard mine roof.

Bit sizes are 1⅜ and 1¾, Style HFD. Prices same for each size, $5.70 to $6.95 depending on quantity.

(ADVERTISEMENT)

Do Your Drilling Speeds . . .

FT./MIN.	SEAM	STATE
4.7	Sewell	W. Va.
5	Miller Creek	Ky.
8	Freeport	Pa.
8	Pittsburgh	W. Va.
5.5	Pittsburgh	W. Va.
9	Miller 8	Pa.
9.5	Eagle	W. Va.

Measure Up?



Kennametal Bits gave an average increase in drilling speed of 23%, in the above cases, over any other bit

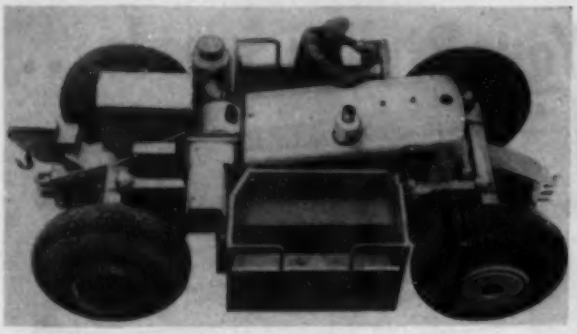
Most of these figures have been used in reports that were sent to management to show how drilling costs were being reduced. And almost without exception, drilling costs are reduced by Kennametal Style D Bits. Kennametal Bits have high quality Kennametal cemented carbide cutting edges which enable them to stay sharp longer, drill faster, and give lowest possible bit cost. Equally important is the Kennametal service engineer who gives each job the full benefit of his specialized experience. The Kennametal representative is your assurance that the right bit will be used, and that it will be used in the right way to give you the lowest drilling cost in your coal. Why not call a Kennametal representative today? Kennametal, Inc., Latrobe, Pa.

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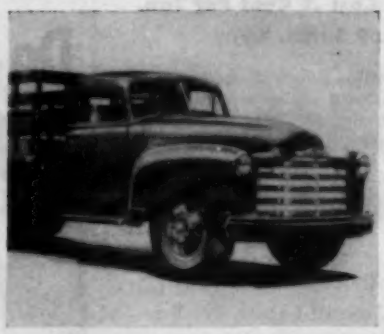
DRILL BITS • MACHINE BITS • ROCK BITS • ROOF BITS

Better Bits for Coal Cutting and Coal Drilling



Diesel-Electric Drive Offers Smooth Power For New-Type Rubber-Tired Unit (3)

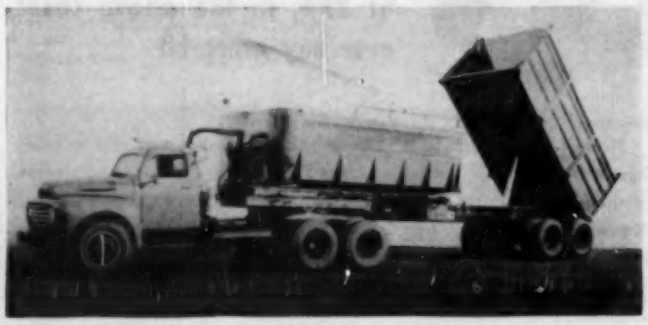
A machine with no clutch, no transmission, and no differential, and which incorporates a new method of power transmission as used on heavy construction equipment—the new electric-drive Tournatow—has been announced by R. G. LeTourneau, Inc. The unit employs a GMC 6-cylinder 186-hp diesel engine which drives ac and dc generators to power all steering and movement of the machine, as well as the 15-ton 60-fpm winch operating through a patented fairhead. The self-generated current actuates an electric motor and gear arrangement in each of the four wheels, with speed control simply accomplished through a potentiometer-type rheostat. The Tournatow has an unusual ability to develop a smooth start, a smooth pull and quick and easy stops, and steering is simply handled by push buttons, LeTourneau reports. It develops speeds up to 25 mph, has a turning radius of 14 ft and is 17 ft 2 in long and 8½ ft wide. Wheel base is 11 ft 4 in and tread is 6 ft 4⅞ in. It will seat 5 men besides the operator and is equipped with a detachable winter cab.—*R. G. LeTourneau, Inc., Peoria, Ill.*



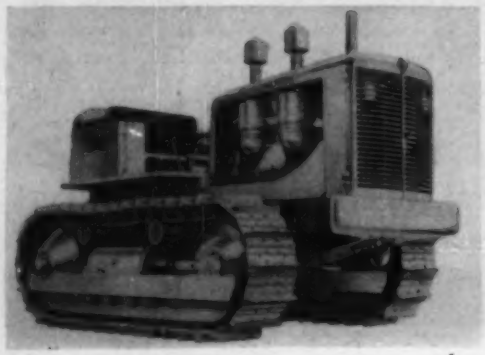
Truck Line Features Wide Size Range (4)

The new 1951 Chevrolet truck line announced last month offers a wide variety of sizes designed for jobs ranging up to difficult cross-country hauls and includes many advances over the previous series, the company reports. More comfort from better cab ventilation and new seat construction, greater safety with newly developed brakes and increased durability engineered into the chassis through various improvements are among the features cited by Chevrolet. The 1951 line includes trucks in 10 wheelbases up to 179-in, with gross vehicle weights ranging from 4,000 to 16,000 lb. Chevrolet makes available two engines of valve-in-head design, the 105-hp Loadmaster and the 92-hp Thriftmaster.—*Chevrolet Motor Division, Detroit 2, Mich.*

Transfer-Type Semi-Trailer Boosts Payload (5)



New Cook Bros. semi-trailer is said by the manufacturer to permit greater maneuverability, increased safety and the largest possible payload capacity without the disadvantages of a long body. Reportedly different from any other on the road, the unit operates similarly to a dump-truck-and-trailer combination and is equipped with the latest-type C-B hydraulically powered transfer system and telescopic hoist. The back half of the trailer is unloaded first and the front half is then transferred into the back half and unloaded. The body and chassis use lightweight high-tensile steel throughout and aluminum bodies are available if desired.—*Cook Bros., Los Angeles, Calif.*



Two Tractors Offer Increased Power (6)

Two new crawler tractors added to the Allis-Chalmers line are said by the company to feature advanced design, materials and power ratings that provide more weight and power than have previously been considered standard for their class. The HD-9 weighs 18,500 lb and has a drawbar-horsepower rating of 70. The larger HD-15 (illustrated) weighs 27,500 lb and develops 102 hp at the drawbar. Both have six speeds forward and three reverse and are powered by a heavy duty GM 2-cycle Diesel engine. Among the features cited by the manufacturer are the constant-mesh transmission, unit-assembly construction and positive lubrication seals in the track assembly that reportedly retain grease for 1,000 hr of operation. A complete line of allied matched equipment is available for each unit.—Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wis.

America's Road to Victory

. . . Let's Increase Production

This is the time to speak out—now—at the beginning.

Our industrial program for re-armament is getting off on the wrong foot.

The talking and writing about it emphasize the wrong things.

Its headline words are "cuts" and "controls."

Those words make bad propaganda for the cold war.

"Cuts" and "controls" are no words to challenge the imagination and energy of our own people. They won't impress the masters of the Kremlin. And they can only make it appear to the rest of the world that America thinks it can defend the free way of life by abandoning it.

America stands as the world's champion against aggression because America has become the most powerful free nation in the world.

How did we get that way?

Not by putting ceilings on wages; not by rationing or clamping iron-clad government controls all over business and industry.

To be sure, some temporary controls are necessary to channel very scarce materials speedily to use for defense. So, too, are special taxes and credit restrictions needed to combat inflation. But they will be fatal if they blind us to this fact:

We became the strongest nation in the world by out-producing every other nation.

Production—The Final Answer

Next year our government is planning at least a $40 billion military program. Instead of planning only on controls to divert $40 billion of production from the making of civilian goods to the making of military supplies, we should be figuring out also ways to push up total production.

Of course, our industrial plant is running at close to "capacity" now. And our labor force has reached almost full employment. There isn't much slack to be taken up.

Can even the United States add a $40 billion miracle of production on top of what it is already doing?

Our answer is "Yes"—and within two years. It can be done by adding about $6 billion each year to our program of capital investment which now runs about $22 billion a year.

Part of this added production will come from expanding our industries. The steel companies, for example, already have plans to increase their capacity almost ten per cent in the next two years.

But by far the largest part of that $40 billion of added production must come from higher productivity—raising industry's efficiency.

continued on next page

To meet our goals we need to raise our productivity five per cent a year.

Can it be done?

The answer is an emphatic "Yes."

Raise Industry's Productivity

McGraw-Hill's studies of industry's equipment show that there are countless opportunities for improving efficiency. Our manufacturing industries alone need at least $35 billion of new equipment to raise their facilities to first class technical standards.

Here are some of the broad possibilities reported by the trained editors of McGraw-Hill's business magazines:

In many manufacturing plants as much as 40 per cent of workers' time goes into moving materials and parts—shifting things about within the plant between processes and to and from shipping platforms.

FACTORY estimates that improved materials handling equipment and methods might well cut handling costs twenty-five per cent and save annually over 650,000 man-years of unnecessary labor.

Modern machine tools designed since World War II are 40 per cent more productive, on the average, than is old equipment. But AMERICAN MACHINIST surveys show that 95 per cent of industry's machine tools are of designs at least ten years old. Replacing them could raise productivity of the metalworking industries at least ten per cent—enough to absorb a major share of the metalworking industries' part of the defense program as now planned.

In coal mining, latest equipment and methods can raise productivity sharply. The editors of COAL AGE estimate that production of bituminous coal could be raised from seven tons per man-shift to ten within three to five years.

Many new textile production techniques are 50 per cent to 75 per cent more efficient than those in use now. If plants could be fully modernized, and full use made of latest management methods, TEXTILE WORLD estimates that output-per-manhour would rise 20 per cent. *A FOOD INDUSTRIES study indicates that modern equipment plus the best management techniques could raise productivity in food processing at least 20 per cent.*

These are just some of the opportunities that industry can seize and by which the nation can profit.

A Nation-Wide Effort

Of course, industry itself can't do the whole job. Labor, government and all the rest of us must cooperate.

Government's part is to see that its emergency controls are so applied that they will increase productivity and thus make possible an early lifting of such controls.

Labor's part is to help in the development of labor-saving methods and machinery and to welcome their adoption as the only sure way of continuing to advance the American standard of living while maintaining the American free way of life.

For all of us the job is to work constantly for an expanding, ever-stronger America with constantly growing productivity; not a pinched and shackled America cooped up under wage and price ceilings and tied to a ration card.

Challenge to Industry

Here is a sharp challenge to industry to study the best work-methods that are being reported—to use every minute and every dollar it can to replace obsolete equipment.

Here is a sharp challenge to government to do everything within its power to make its control policies and its fiscal policies strengthen the incentives to industrial modernization—to demand sacrifice for a purpose and not for effect.

The job to which such opportunities point will take time—though nothing holds back adoption of some of the simpler improvements in work-methods reported in business magazines all the time.

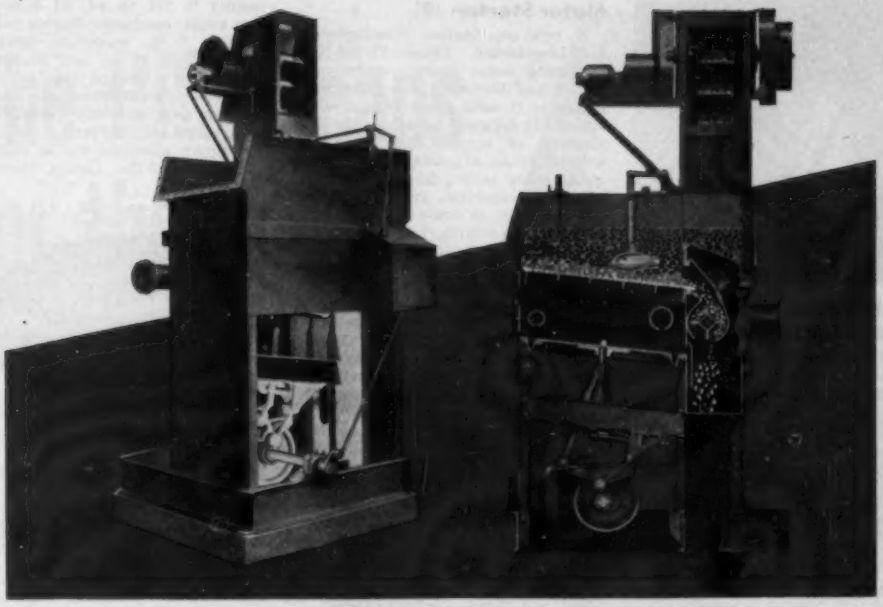
But increasing production is our one best hope that we may be spared the full array of price, wage and production controls now and be freed eventually from all controls.

General Omar Bradley has said that the protection of our national independence calls for "long-range commitments that we are willing to carry out."

A long-range commitment to fight this battle for peace with America's most powerful weapon—industrial productivity—is the surest guarantee of victory for the free world.

Let's make that commitment—now—at the beginning.

McGraw-Hill Publishing Co., Inc.



JEFFREY 60" ONE COMPARTMENT DIAPHRAGM JIG
with 25 SQUARE FEET OF SCREEN AREA
(Cross-section shows Washing Principle)

For Low Cost Coal Cleaning



THE JEFFREY JIG

THE JEFFREY MANUFACTURING CO.
Established in 1877
912 North Fourth Street, Columbus 16, Ohio

For More Data on These and Other Items in This Section, Use the Card Facing p 112



One Instrument Makes Three Air Measurements (7)

Highly accurate measurements of air velocity, temperatures and static pressure are possible with one easy-to-use instrument, the Anemotherm air meter, the manufacturer reports. Direct readings in fpm, water gage and degrees F are given on the scale on the top of the compact meter, thus eliminating the need for tables or extra calculations. Velocity scales range from 10 to 6,000 fpm, temperature readings from 30 to 155 deg F, and static pressure from 0 to 10-in water gage, positive, and 0 to 4 in, negative. The unit consists of a sensing probe and the instrument case containing the meter, batteries, switches, etc. Full details are available from the *Anemostat Corp. of America, New York, N. Y.*

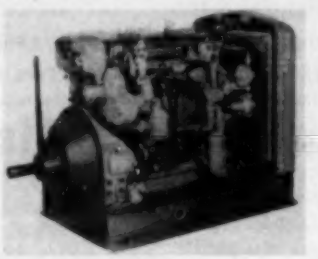


Truck Line Offers Varied Features (8)

More than 180 models newly designed to reduce operating costs, make trucks adaptable to more jobs and add driver convenience and comfort are included in the 1951 Ford Truck line, the company reports in announcing scores of engineering, styling and safety improvements covering the four Ford truck engines, chassis changes and the introduction of a new "5-Star Extra" cab. Among the features cited is the automatic Power Pilot carburetion-ignition control on all engines, which is said to increase fuel economy by metering and firing the correct amount of fuel under varying loads without spark knock. Restyling of the cab and front end offers improved appearance, greater visibility and added driver comfort, it is said.—*Ford Motor Co., Dearborn, Mich.*

Motor Starter (9)

A new combination Westinghouse Life-Linestarter, Class 11-206-N—combining motor starter, motor protection and disconnect in a redesigned enclosure to save space and increase safety—is designed for across-the-line starting of squirrel-cage induction motors, or as a primary switch for wound-rotor motors. The unit is available with capacities from ¼ to 100 hp, and 110- to 600-v polyphase, in NEMA sizes 0 through 4, and NEMA type enclosures, 1, 1A, 3, 4, 5, 7 and 9. The new Life-Linestarter component provides fast, trouble-free operation as a result of the simple action of a see-saw pivoted on a knife-edge bearing with a kick-out spring to insure positive opening, the maker says. Delayed tripping of safe overloads and instantaneous action on short circuits is provided by the quick-make, quick-break thermal-magnetic AB De-ion circuit breaker. Designed for use with up to three safety padlocks, the slam-proof self-indicating handle also is interlocked to prevent opening of the enclosure when breaker is closed.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*



Dual-Fuel Engine (10)

Natural-gas changeover unit for GM Series 71 diesel engines permits them to burn either natural gas with a pilot charge of diesel fuel or diesel fuel alone, without interference with the operation of the units as straight diesel-fuel engines when required. The feature is available on new engines leaving the factory and a factory-engineered kit facilitates application to engines already in use. For engines operated both in natural-gas areas and in areas where natural gas is not available, the changeover permits the added economy of natural gas whenever available and offers maximum flexibility between the two forms of operation, the maker says. Booklet available.—*Detroit Diesel Engine Div., General Motors, Detroit 28.*

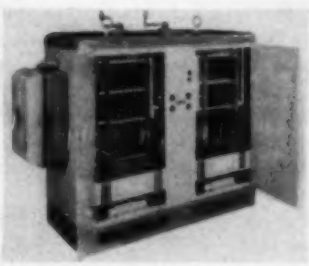
Stripping Unit (11)

A new stripping front end especially adaptable for spoiling over-burden on high banks well away from the machine, has been announced for the hydraulic-coupling-equipped Lorain 820 shovel. The boom is 34 ft long and the dipper stick 27 ft long. Dipper capacity is 1¾ cu yd. At a 55-deg boom angle, maximum digging height is 43 ft 5 in, maximum dumping height, 33 ft 11 in, and maximum radius of cut at ground line, 31 ft 8 in. A power-operated tilting and folding gantry is used with this special front end to eliminate interference with the long dipper stick, the maker reports. —*Thew Shovel Co., Lorain, Ohio.*



Electric Motor (12)

New Electric Machinery line of heavy-duty wound-rotor induction motors is said by the maker to provide variable speed drive and also to be advantageous on applications requiring high starting torque and low-starting current, or long acceleration periods. Built in ratings from 30 to 1,500 hp, the motors feature drip-proof construction as standard, with splash-proof or enclosed forced-ventilation models also available. The heavy-duty fabricated steel frame offers high physical impact strength and crack-proof steel-bar feet. Units are available with either ball- or split-sleeve-style bearings to provide long wearing qualities and are easily accessible for inspection and maintenance, it is said.—*Electric Machinery Mfg. Co., Minneapolis 13, Minn.*



DC Welders (13)

New Westinghouse dual 300/600- and 400/800-amp selenium-rectifier dc welders offer two welding circuits in one common enclosure, which may be used independently or in parallel to provide a single circuit of twice the capacity. Parallel operation of the two units for maximum capacity is obtained by a bridle placed across the secondary output terminals. A clutch-and-sprocket and chain arrangement permits independent or unit operation of the current control handles on each individual welder. A primary

The RIGHT caps for the job...



Du Pont Iron Wire Electric Blasting Caps!



Cost less . . . better visibility in coal . . . easy to remove by magnetic separators

More and more coal mine operators with an eye on rising costs are switching to Du Pont Iron Wire Electric Blasting Caps.

Specially designed for use in coal mines, Iron Wire Caps cost less than most other electric caps, yet have many exclusive advantages.

White insulation on wires makes them easy to see in even the poorest light—an important safety factor. And Iron Wires can be removed from broken coal by magnetic separators—another feature worth considering.

Think of these 3 points—low cost, greater visibility and easy removal—the next time you order electric blasting caps. Then be sure to select Du Pont Iron Wire Electric Blasting Caps. You can't buy a better iron wire cap! E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

* OF COURSE . . . you can be sure of top performance from all Du Pont Electric Blasting Caps, regardless of type. All have nylon-insulated leg wires, rubber plugs and shielded shunts to assure maximum safety and effectiveness.

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

RIGHT IN THE GROOVE



You just can't beat the COMPLETE Victaulic System for efficient piping construction... it's the EASIEST WAY TO MAKE ENDS MEET!

EASY, QUICK, SURE—that's the Victaulic Method. Pipe ends are joined in a jiffy by a simple two-bolt coupling. A speed or T-wrench is the only tool required. AND pipe joints will stay positive-locked, leak-proof with Victaulic Couplings. They're designed to stand up under extreme pressure, vacuum or strain conditions!

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To give complete versatility and dependability to the Victaulic Method, Victaulic offers a complete line of Full-Flow Elbows, Tees, and other fittings all carefully designed for free-flowing efficiency.

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The easiest way to make ends meet
VICTAULIC
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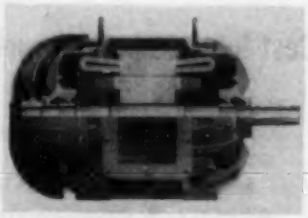
contractor is supplied to facilitate use of the machines on automatic and stud-welding applications.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*

Variable-Speed Drive (14)

A new variable-speed transmission series, incorporating the Worthington tandem-belt design and known as the Worthington Allspeed drive, consists of six models, ranging from 1 to 15 hp, with ratios of 16:1 to 6:1. With the tandem-belt design, the units are particularly suited to applications where space limitations require extreme compactness, it is said. Handwheel control is normally supplied, with electrical remote controls available where required. Wide-spaced bearings maintain the input and output shafts in true alignment, regardless of belt-tension load, the maker says. Allspeed drives are available as a "packaged" unit, with built-in NEMA standard motors, or modified to suit specific requirements. Bulletins available.—*Worthington Pump & Machinery Corp., Allspeed Drive Div., Holyoke, Mass.*

Conveyor Roll Bearings (15)

Newly improved M-R-C conveyor roll bearings are said by the manufacturer to offer design features that result in reduced belt and maintenance costs, along with improved belt alignment and performance. The bearings require no relubrication, are easily replaceable, incorporate an improved bearing seal and feature rust-resistant exterior surfaces, it is reported. Construction and sizes are covered in bulletin available from the *Marlin-Rockwell Co., Jamestown, N. Y.*

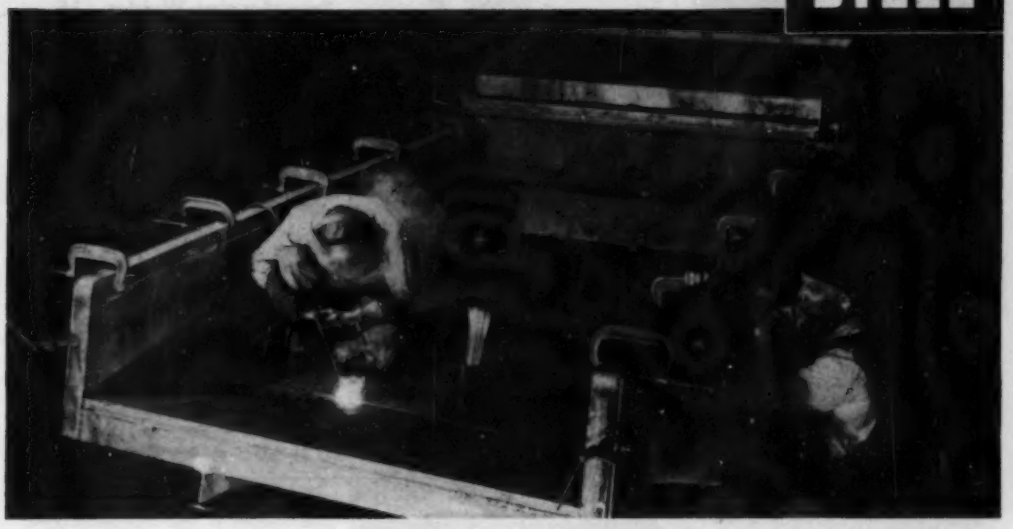


Explosion-Proof Motor (16)

New Crocker-Wheeler line of explosion-proof motors, approved by Underwriters' Laboratories for Class I, Group D, Class II, Group F, and Class II, Group G, hazardous locations, feature a totally enclosed fan-cooled design and are an adaptation of the company's "Sealedpower" units. Cooling air is directed by an external fan over fins which are cast into the corrosion-resistant grey cast-iron frame and there are no internal passages to clog and cause overheating, it is said. Bearings are double-row width, prelubricated and sealed, requiring no attention for at least 5 yr,

Moore Body Company "ARMORS" Truck-Bed Bottoms with J&L Jalloy Heat-Treated Plate

J&L STEEL



Impact- and Abrasion-Resistant Jalloy Plates Increase Service Life . . . Cut Deadweight of Moore Truck Bodies

The Moore Body Company of Reading, Pa., builds truck bodies for the mining industry where equipment really takes a beating. Moore has standardized on J&L Jalloy heat-treated plate to "armor" its truck-body bottoms against impact and abrasion.

The reason:—J&L Jalloy has a yield strength and Brinell hardness four times as great as mild steel. This makes it possible to cut deadweight by reducing plate thickness, and at the same time increase service life through Jalloy's high strength and wearing qualities.

For example, in Moore Body Company's 9 cu. yd. stripping body, 3/16" Jalloy has replaced 1/4" mild steel, and yet Jalloy's strength and hardness ensure increased resistance to abrasion and impact. Most important to cost-conscious mining men who must replace worn out truck beds—J&L JALLOY LASTS FOUR TIMES AS LONG AS MILD STEEL YET IT COSTS ONLY TWICE AS MUCH.

It's easy to see why more and more progressive mining companies have found that J&L Jalloy can do a dollar-saving job in such applications as chute liners, bulldozer blades, shovel buckets, and other places where impact and abrasion limit the life of equipment.

If you're responsible for the economical operation of earth-moving or handling equipment, you'll profit by writing for a free copy of our booklet, "For Longer Wear . . . Less Repair." It gives you complete information about J&L heat-treated Jalloy plate and shows you how others are saving money with this modern mining and quarrying steel.

Workman welding 3/16" Jalloy heat-treated plate in this Moore truck body. In construction no significant welding problems have been encountered.



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PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS



Impartial tests and cost studies by well-known laboratories prove that Johnsonite Plastic Pipe has a life in excess of 30 years . . . whether buried in the ground or exposed.

It continues to effect economies by carrying more liquid at less power input, due to extremely low loss of heat from friction—1½ times less than conventional pipe.

Johnsonite Plastic Pipe is so flexible it can be tied in a knot. It finds its own floor, it's corrosion-proof and acid-resistant.

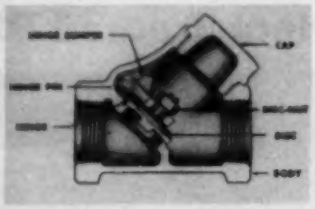
Complete details are in our new catalog.

JOHNSON PLASTIC

CORPORATION

BOX 268
CHAGRIN FALLS, OHIO

the maker reports. The units are available in NEMA frames 364 through 505. Bulletin SL300-5 gives details.—*Crocker-Wheeler Div., Elliott Co., Ampere, N. J.*



New Valve Line (17)

A new line of Crane Y-pattern brass swing check valves, of the regrinding type, are in the 200- and 300-lb pressure classes. Screwed-end patterns are available in sizes ¼ to 3-in, inclusive; flanged end patterns in sizes 1 to 3 in inclusive. Improvements over the usual regrinding check valve cited by the maker for the new design include a large cap opening on the same center line as the seat opening, permitting easy access for regrinding or replacement of parts; easy contours in the Y-pattern body offering minimum resistance to flow; and closure on backflow that is fast and positive. The new check valves can be used on lines where flow is horizontal or upward. Bulletin available.—*Crane Co., Chicago 5.*

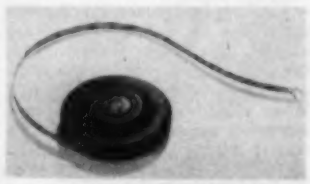
Transformer Welder (18)

The new Airco 200-amp Model MCX transformer welder is a small compact arc welder, measuring 12x17x23 in, that is designed to cover a wide range of applications from light-duty sheet-metal jobs up to heavy-duty industrial work, the maker says. The MCX has a full 200-amp 50% duty cycle, NEMA rating, and offers three current ranges selected by insulated tapered plug connectors and infinite hand-crank adjustments within each range that provide currents from 30 to 250 amp and permit the use of 1/16 to 3/16-in-diameter electrodes. It employs an automatic hot-start control with a hermetically-sealed gas-filled time-delay relay magnetic switch that has no open contact.—*Air Reduction Sales Co., New York 17.*

Equipment Shorts You'll Want to Check



(19) EXTREMELY FINE AND UNIFORM FOG DROPLETS at low operating pressures are possible with a new Bete line of low-gallonage nozzles, the manufacturer reports. Employing the "pin-jet" impingement principle, the new nozzles have no internal parts and cannot clog with foreign particles smaller than the orifice size, it is said. They are made in 10 orifice sizes, available from stock in brass and made to order in various other metals.—*Bete Fog Nozzle, Inc., Greenfield, Mass.*



(22) FULL-LENGTH STEEL-TAPE RULE, the new 50-ft Master Longboy-050 is reported by the maker to be the first field tape which requires neither hand cranking nor reeling, rewinding automatically in 10 sec. An additional cost feature is the replaceability of the tape alone when worn or damaged, without replacing the case and its internal tape-drum and rewind mechanism. The 50-ft Longboy sells for $12, with a 100-ft model to be available shortly expected to cost about $16. Alternate 50-ft tapes may be had for $6.—*Master Rule Mfg. Co., Inc., Middletown, N. Y.*

(20) FOR HEATING on stripping and construction jobs and other temporary applications, portable Thermoblocs provide a complete heating unit, including fuel tank, mounted on easily moved trucks that permit spotting them where most effective. Said by the maker to be more efficient and less space-consuming than many conventional methods in use, the units are supplied for outputs of 100,000 and 200,000 Btu, 300,000 Btu and up to 1,000,000 Btu. Bulletins available.—*Thermobloc Div., Prat-Daniel Corp., East Port Chester, Conn.*

(21) RESPIRATOR—New A-O No. 2099 Air Line respirator is recommended by the maker for such operations as paint spraying, welding, cleaning tank cars and abrasive blasting, and is said to be expecially useful where contaminants are unusually heavy. Available with 12½ to 50 ft of 5/16-in air hose, the No. 2099 protects against dusts, fumes, vapors, mists, smokes and gases, and is designed to operate at air-line pressure between 9 and 25 psi.—*American Optical Co., Southbridge, Mass.*

(23) WORK-GLOVE RECONDITIONING SERVICE, which, according to the company, is saving one large user over 80% of all gloves sent in for salvage, now is offered on a national basis. The service includes complete renovation, sanitising and packaging of all types of worn-out fabric and leather gloves and protective clothing, with material savings over the cost of new gloves, the company reports. A free trial plan is available from the *U. S. Industrial Glove Corp., Detroit 4.*

(24) SPRAY GUN SPURTING, which often projects a blob of heavy industrial material upon the coated surface, is completely eliminated by the new Graco Mogul-Type Powerflo pump, the manufacturer reports. Operating from original 400-lb and 100-lb drums, or in bucket-type containers, Mogul pumps evenly spray a variety of materials, including gummy mastics, and operate on an air pressure ranging from 20 to 175 psi.—*Gray Co., Inc., Industrial Div., Minneapolis 13, Minn.*

(25) NEW BULLDOZERS, grade-builders and root rippers especially designed for the newly announced Models HD-9 and HD-15 Allis-Chalmers tractors, and for the A-C HD-20, are available from Baker Mfg. Co. in both engine-mounted hydraulic and cable-operated models. Major feature of the Baker attachments is the "fingertip" control that reduces working and wearing parts and permits easier maintenance of full positive control. Complete specifications are available from Baker-Allis-Chalmers dealers or direct from the *Baker Mfg. Co., Springfield, Ill.*

(26) COMPRESSED-AIR CLEANERS—Swartwout Airfuge separators for cleaning compressed air by means of centrifugal force are available in seven sizes from ⅛ to 2½ in and are said to remove 99% or more of all impurities without pressure drop, including moisture, oil, scale and other solids. Other separators are available for removing unwanted liquids or solids from steam, air or vapors under pressure or vacuum. Bulletins available.—*Swartwout Co., Cleveland 12, Ohio.*

(27) LARGE-SIZED FIRE EXTINGUISHER is the Alfco 350 wheeled portable unit easily pulled by two men, which carries 350 lb of dry chemical compound, discharged at a maintained operating pressure of 200 psi. Designed to fight Class B and C fires, the unit has 50 ft of 1-in hose and a discharge range of 20-25 ft. Bulletin available. — *American LaFrance-Foamite Corp., Elmira, N. Y.*

(28) PORTABLE AIR COMPRESSOR—Newly improved 105 portable air compressor, built around the standard Worthington Blue Brute compressor and powered by either Diesel or gasoline engine, is said to offer more

REMOVE TRAMP IRON

WITH *Stearns*

SUSPENDED MAGNETS

LOWEST COST WAY





PROTECTION

SAVES MONEY!

Here's the economical way to protect crushers, grinders, pulverizers and other vital equipment — use a STEARNS Suspended Magnet over your conveyor belt or head pulley. This STEARNS Circular Suspended Magnet is one of two installed at the National Gypsum plant at Savannah, Ga., to remove all tramp iron before the rock enters the crushers.

You can protect your machinery and purify your product the low cost, positive way. Eliminate all tramp iron with STEARNS Suspended Magnets — this means fewer repair bills on crushing equipment, fewer shutdowns and higher production.

Whether you are handling rock, slag, coal or ore, investigate STEARNS Suspended Magnets; they're easy to install and have low operating and maintenance costs. Write today for descriptive literature on both circular and rectangular suspended magnets.

Complete laboratory and testing facilities available for separation tests on your materials.



STEARNS Circular Suspended Magnet for inclined installation over head pulley.



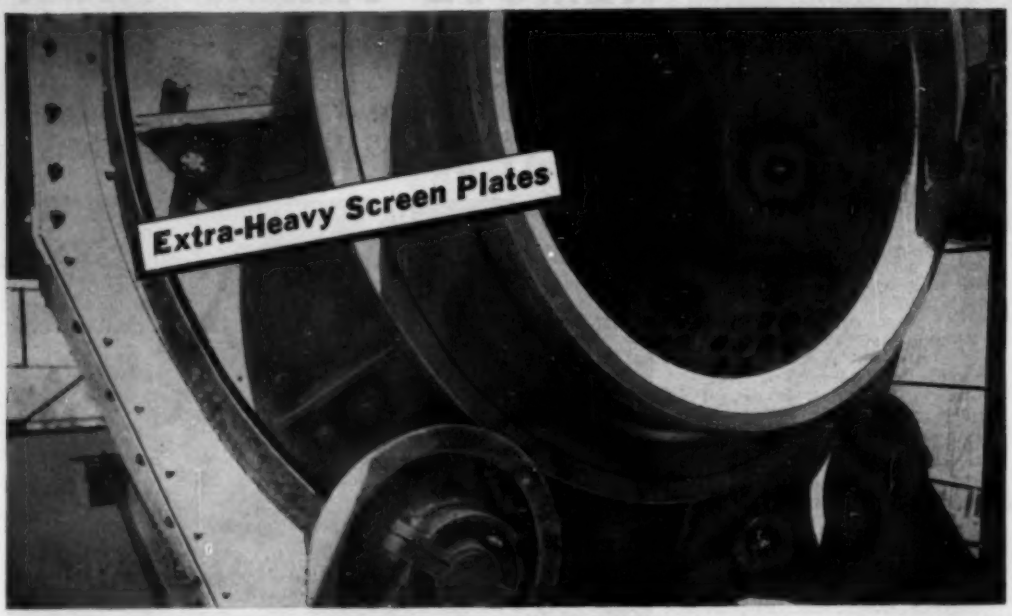
Rectangular Suspended Magnets available in sizes and shapes to meet your requirements.



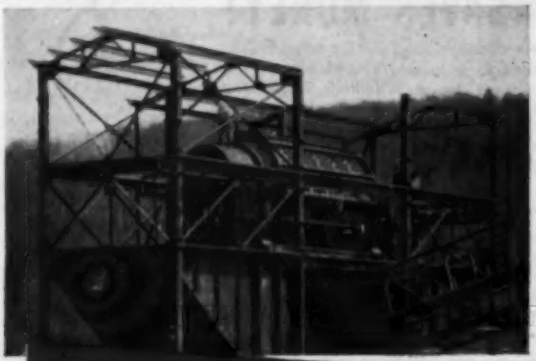
Stearns MAGNETIC MANUFACTURING CO.

661 S. 28th St., Milwaukee 15, Wis.

BIG FEED OPENING



CONDITIONS COAL FOR CLEANING PLANTS



PENNSYLVANIA
BRADFORD BREAKER

PENNSYLVANIA CRUSHER COMPANY

Removes Largest Rock & Debris

Built specifically for coal mine and cleaning plant service, Pennsylvania's heavy-duty Roller-Mounted Bradford Breakers have *no obstructions* at the feed *or* discharge ends. Large coal, rock, mine timbers, tramp iron move freely into the Breaker and out the refuse chute. Equally important, Pennsylvania's "Laclede" screen plates are extra thick section and double-bolted, absorb years of punishment. When those large rocks come up with the coal, a Pennsylvania can handle them.

Don't try to make an obsolete or light-duty breaker do a job it wasn't designed for—the result can only be damage, delay and costly repairs. Instead, install a Heavy-Duty, Roller-Mounted Pennsylvania. These specially-designed Breakers soon pay for themselves in trouble-free, low-cost service.

Incidentally, Pennsylvania Bradfords mechanically remove *all* hard debris larger than screen perforations. They greatly reduce the load of refuse handled by cleaning plants and protect washers against damage by large debris. Capacities to 1500 TPH. Low power demand. Write for Bulletin 3007.

PENNSYLVANIA CRUSHER COMPANY, *Division of Bath Iron Works Corporation*, 1711 Liberty Trust Building, Philadelphia 7, Pennsylvania. Representatives in New York—Boston—Pittsburgh—Birmingham—Roanoke—Detroit—Chicago—St. Louis—Crosby, Minn.—Los Angeles—London, England.

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economical operation and greater maneuverability. The new compressor is 10 in shorter and 4 in lower and weighs 800 lb less than previous models.—*Construction Equipment Div., Worthington Pump & Machinery Corp., Holyoke, Mass.*

(29) ANGLE SEAT-FEED OILING VALVES—Newly developed Oil-Rite line of valves for pressure or gravity oiling systems can add to permit countersink of an oiling system at low cost and offer extremely free-flow characteristics, with flow of all visually checked and closely regulated. They can be used singly, Style SFG, or gang-mounted, Style SFM, for a central oiling system. Details available from *Oil-Rite Corp., Milwaukee 11, Wis.*

(30) SWITCHBOARD INSTRUMENTS—New Westinghouse Full-View Type E-24 draw-in-scale switchboard instruments are said to feature a new concept in dial and cover structure, and provide maximum readability from the steepest angles, with no objectionable shadows on the scale even under adverse lighting conditions. The new design is the same as the original Type E-24 except for the larger cover and dial, and the original Type E-24 instruments can be readily converted to the Full View type simply by replacing the dials and covers.—*Westinghouse Electric Corp., Pittsburgh 30.*

(31) THORIATED TUNGSTEN now is available as a non-consumable electrode (Thor-Tung) for Heliwelding.—*Air Reduction Co., New York 17.*

(32) CONCRETE DRILL—New electromagnetic System Model 10-RO hammer drill for high-speed drilling in concrete, brick and stone, features automatic reboun of the carbide-tipped spiral drill that speeds up hole drilling, eliminates manual turning of the drill chuck and reduces fatigue, the maker says. Its weight of only 11½ lb makes it suitable for easy, one-handed drilling of holes in awkward places. Bulletin available.—*Systron Co., Homer City, Pa.*

(33) COUPLING—A new type Thomas centrifugal clutch coupling for use with heavy equipment is designed to permit "Vertical-Lift" from the mounting of either driver or driven equipment without disturbing either member, whenever moving heavy equipment is a problem. It is applicable to most dual driven on pumps, fans, generators, etc., and especially where space restrictions make telescoping or coupling for assembling and disassembling extremely difficult or impossible, the maker says. Rating and selection tables for the sizes supplied are available from the *Centerlo Clutch Co., Cranford, N. J.*

EQUIPMENT BULLETINS

Yidee Helpful Catalogs Are Available Without Obligation—Merely Circle the Proper Number on the Postage-Free Card Above.

(34) COAL DRYER—Design, features and operation of the new Baughman Verti-Vane thermal coal dryer are illustrated and described in Bulletin 18—A just issued by Robert Helmes & Bros., Inc., Danville, Ill. The booklet discusses process installations and contains cutaway and cross-section views of the unit.

(35-39) PLASTIC PIPE — Carlon Products Corp., Cleveland 5, Ohio, has five new catalogs, which may be requested by circling the respective number on the postage-free card in this section. The catalogs cover the properties and application of Carlon plastic pipe and tubing as follows:

(35) General brochure, entitled "Carlon Plastic Pipe," covers six types of flexible and rigid plastic pipe and tubing recommended for a wide range of applications.

(36) Catalog H deals with flexible Carlon E corrosion-proof plastic pipe recommended by the maker for use in coal mines, processing plants and for low-pressure applications involving transmission of gases and highly corrosive vapors.

(37) Catalog EP describes flexible Carlon EP pipe for handling drinking water and other industrial applications.

(38) Catalog T covers rigid lightweight Carlon T plastic pipe, guaranteed against rust and electrolytic corrosion.

(39) Catalog C deals with Carlon C plastic tubing.

(40) LOADING MACHINE—Bulletin CL-11-601 available from the Goodman Mfg. Co., Chicago 9, covers operating and design features of the new Goodman crawler-mounted 600 duplex, built for use in high coal with large-capacity shuttle cars and featuring a loading capacity of 8 to 10 tons. The illustrated bulletin includes full dimensions.

(41) VIBRATING SCREENS—Link-Belt Co. eccentric-action vibrating screens for medium and heavy-duty service, accurate sizing, thorough rinsing and rapid dewatering of a wide range of materials are illustrated and described in a new 12-p Book 2264, available from Link-Belt Co., Chicago 1, CA vibrating screens 6 ft wide by 20 ft long to a 5x16-ft screening surface, in single, double or triple-deck models and for suspension or floor-mounting. The book offers detailed dimensions, weights and other engineering layout data, including a page on how to select the right size

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TO:—I would like more information . .

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (Jan., 1951)

1	6	11	16	21	26	31	36	41	46	51	56
2	7	12	17	22	27	32	37	42	47	52	57
3	8	13	18	23	28	33	38	43	48	53	
4	9	14	19	24	29	34	39	44	49	54	
5	10	15	20	25	30	35	40	45	50	55	

In addition, please send me data on these other products advertised in this issue (give name and page number)

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EQUIPMENT BULLETINS AVAILABLE—Cont'd
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of screen for given capacities over square openings of up to 3 in.

(42) HYDRAULIC-OIL MAINTENANCE, instructions for cleaning systems and tips on oil-testing and draining are presented in an 18-p booklet prepared by Sun Oil Co., Philadelphia 3. Called "Debug Right by Your Hydraulic System," the booklet includes complete trouble-shooting charts, with practical detailed instructions for correcting many of the common troubles that may occur in almost any hydraulic unit. Copies are available, without cost, for distribution to maintenance personnel.

(43) SHUTTLE CARS — Bulletin CUTS-502 describes and illustrates the operating features of the Goodman Types 570-571 and 580-581 cable-reel shuttle cars equipped with hydraulically controlled elevating discharge. The bulletin, available from the Goodman Mfg. Co., Chicago 9, includes specifications, capacities, speeds and dimensions for the four units.

(44) COAL-PROCESSING EQUIPMENT—New 12-p bulletin on Cedarapids coal-processing equipment, issued by Iowa Mfg. Co., Cedar Rapids, Iowa, describes the new Cedarapids coal crusher for hard, soft or cannel coal; the Cedarapids Low Head mine conveyor; and various types of Cedarapids vibrating screens. Detailed specifications, descriptive and operation are also given for the Cedarapids "packaged" coal tipple—a complete coal-preparation plant for small mines.

(45) "10 QUESTIONS TO ASK A DIESEL ENGINE SALESMAN," being offered by the Murphy Diesel Co., Milwaukee 14, asks and answers 10 questions on diesel-engine design and gives full mechanical details on the Murphy Diesel line of engines.

(46) CENTRIFUGE—Bulletin from Centrifuge Mechanical Equipment, Inc., N. J., Div. of Condenser Service & Engineering Co., Inc., Hoboken, N. J., offers detailed data on the design and operation of its line of CME continuous centrifuges for dewatering, classifying, thickening, etc. The units are available in screen and solid-bowl types in capacities ranging from 1 to 15 tph, with larger sizes available on order.

(47) STORAGE BIN—12-p folder describes the design and construction of storage bins manufactured and erected by The Neff & Fry Co., Camden, Ohio. Featuring a diagonal-reinforced "super-concrete" stave, which is formed under 140 tons hydraulic pressure to give its rock-like density and high-crushing strength, the structures may be erected for various uses in addition to storage of coal and other materials. The bulletin includes data tables and capacities, a list of users and illustrations of typical installations.

(48) CRANE AND DRAGLINE—The Manitowoc Model 3500 long-mast crane and dragline is described in a 12-p catalog just released by the Manitowoc Engineering Works, Manitowoc, Wis. The unit is rated as a 2-yd dragline, with lift capacities of 60 tons at 12-ft radius and 20 tons at a 30-ft radius. Complete working ranges and capacity tables, features and machinery details and varied job applications are covered in the booklet.

(49) CORE DRILLS—E. J. Longyear Co., Minneapolis, Minn., has issued Bulletin 52 covering operating features, design and specifications of its line of diamond core drills. A wide range of models is illustrated and described.

(50) CARBURETED ENGINES—Folder A-SII-NN from International Harvester Co., Chicago 1, offers complete specifications and on-the-job illustrations on its line of carbureted engines and power units designed for a variety of applications.

(51) CRANES—New 20-p bulletin, covering the application of Loraln cranes to industrial material handling, issued by the Thew Shovel Co., Lorain, Ohio, contains over 20 illustrations showing Loraine on-the-job in many types of industries and handling many types of material. The booklet is designed primarily to offer ideas on material handling.

(52) WIRE ROPE FOR EXCAVATING EQUIPMENT, a new catalog issued by John A. Roebling's Sons Co., Trenton 2, N. J., offers actual recommendations for specified ranges and includes the wire-rope code which has not previously been published. Recommendations for various types of units are arranged for easy reading.

(53) POWER SHOVEL—Bulletin 402 from Marion Power Shovel Co., Marion, Ohio, gives a complete design and performance story on the Type 111-M unit, which is equipped with diesel power, electric swing and Marion air control and is available for service as a shovel, dragline, clamshell, crane or long-range shovel, with bucket capacities up 5 yd.

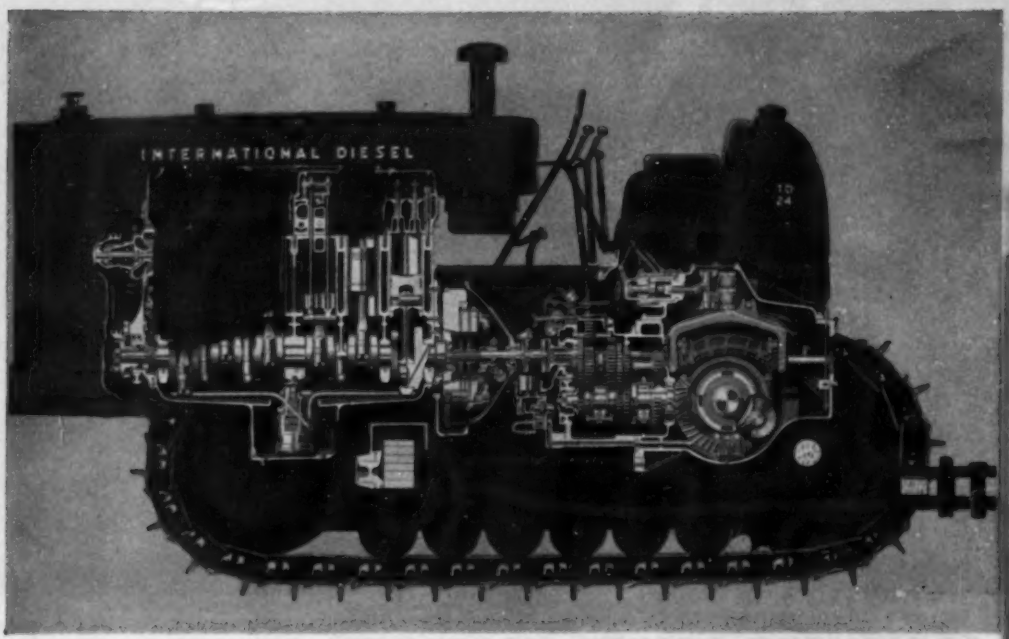
(54) "REBUILDING WHEELS OF MINE LOCOMOTIVES by Unionmelt Welding," a reprint of an article describing the equipment installation and operating procedure at one of the companies now doing this type of work, may be secured by requesting Folder P-1246 from The Linde Air Products Co., New York 17.

(55) TRANSMISSION BELTING—A concise technical bulletin on flat transmission belting designed to aid in selecting the right transmission belt to meet individual problems is available from Thermoid Co., Trenton, N. J. The bulletin, Form 2075, contains formulas, charts and tables for the proper selection of transmission belting.

(56) DIESEL POWER UNITS—International Harvester Co., Chicago 1, has issued a new Folder A-SII-NN describing its line of Diesel engines and power units and illustrated with actual on-the-job photos of typical units in operation. IH Folder A-SII-NN, also available, offers actual cost and operating details of the IH line of engines and power units.

(57) MOBILE CRANE—24-p catalog offered by Bay City Shovels, Bay City, Mich., contains 74 photos illustrating the features, design and job applications of the "Crawlstable," a 20- to 25-ton, self-propelled crane unit that features high flexibility and mobility, road speeds up to 25 mph and versatile application to a wide range of lifting and placing jobs.

GUTS OF A CHAMP



Inside story of the TD-24

When two-legged people have guts, they finish the fight and do the job.

Real guts—that's what the world admires—man or machine.

You can't define what makes guts in a man, but you can "analyze" the fighting, working, dogged innards of the Champ. So let's put the X-ray on the TD-24:

Drawbar Horsepower: 148 working horsepower delivered at the drawbar in official tests.

Synchromesh Transmission: you "shift on-the-go," with eight speeds forward, eight reverse for faster time cycles.

Instant Speed Change: up or down one speed without declutching.

Planet Power Steering: all turns are easier . . . pivot turns, feathered turns, turns with power on both tracks.

Reserve Torque: gives the Champ the lugging ability to fight through temporary overloads.

Easy Steering: finger-tip hydraulic controls.

All-Weather Starting: push-button, gasoline-conversion starting—an International exclusive—gets you on the job fast.

More Work: the TD-24 is doing more work—with more speed and more lugging ability—than any other crawler tractor on the market.

Look it over. Then ask your International Industrial Distributor to show you what it can do for you. You'll be a TD-24 man from then on in.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL **POWER THAT PAYS**



EQUIPMENT BETTER PROTECTED AT LESS COST

Sun Mine Grease Again Proves Its Superiority, Keeps Loaders Working—Builds Up the Profits

This loader, one of 36 in a western Pennsylvania mine, can fill a 5-ton car in a couple of minutes. That's action, and it takes more than an ordinary grease to protect the bearings and drives.

At first the mine used a product that formed gummy deposits in the bearing-grease reservoir. This kept fresh grease from reaching the bearings and caused excessive wear. Subsequently other products were tried out—with somewhat better results. But in every case the price was higher than good business-judgment could approve.

Next the mine turned to a "Job Proved" Sun mine grease, known to many producers for its performance plus economy. In over 18 months there has not been a single breakdown due to lubrication, even with the equipment occasionally overloaded. Much of the time the loaders run at top capacity. Output is high—and profitable. Grease costs are low.

There are "Job Proved" Sun mine oils and greases for every lubrication need, whether in producing, transporting, or processing.

Wherever used, these products are contributing to economical operations. Call in your nearest Sun Industrial Products man for consultation on your problems.

SUN OIL COMPANY - *Philadelphia 3, Pa.*
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SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO



W. Va. Foremen May Not Double As Firebosses

The West Virginia Supreme Court ruled Dec. 5 that foremen may not double as firebosses. The 3 to 2 decision reversed an earlier ruling, Sept. 3, 1949, of the Kanawha County Circuit Court. The majority opinion in the supreme court decision held that the state code requires employment of a qualified person as fireboss and a different person as foreman.

Though the supreme court's decision upheld an earlier order of the state mining department, Arch J. Alexander, chief, Department of Mines & Minerals, said that his office could not enforce the decision until an earlier injunction was dissolved. The injunction, obtained by 58 coal companies, forbade enforcement of the departmental order. The question of dissolving the injunction has been referred to the state's attorney-general, Mr. Alexander said.

The original departmental order, stipulating that foremen must not act as firebosses, was issued 2 yr ago to the accompaniment of scattered strikes protesting the double role of foremen. When Circuit Judge Bouchelle granted an injunction against the order, Mr. Alexander appealed to the supreme court.

Operators, commenting on the latest decision, argued that it would require employment of an additional 2,000 men in the state and would push operating costs higher. Union officials, however, were jubilant, stating that the decision "puts the responsibility for safety into the hands of an independent man who has been certified by the department of mines for the job."

Shortly after the decision was handed down, Mr. Alexander announced that coal companies would be given "a reasonable time" to comply with his 2-yr-old directive.

In another ruling, the state supreme court refused to review a circuit court decision holding that a fireboss is not entitled to jobless benefits during a strike. The action involved a fireboss who worked the first day of a strike but was idle thereafter for the strike's duration. The fireboss claimed that though he was a dues-paying member of the UMWA, he was not required by the union to stay away from work and therefore was idled involuntarily. An examiner had refused payment of benefits but a board of review had reversed the examiner and upheld the fireboss' claim. The company involved appealed the review board's decision to the circuit court, which reversed the board and denied that the firebosses' type of employment was "controlling."

European Coal Deficit Spurs Exporters' Hopes

With a shortage of 6,000,000 tons of coal and coke predicted in Western Europe for the first quarter of 1951, American coal exporters have been told to expect an upward swing in shipments to Britain and Western Europe. This prediction was made by F. F. Estes, executive secretary, at a meeting late in November of the Coal Exporters' Association of the United States.

Coal already is beginning to move from United States ports to Europe and payments are being made in dollars, Mr. Estes said. Pointing to the situation in Great Britain, where coal mining is nationalized, he said that if American coal moves to Britain this year, it will be for the first time since 1947, when slightly less than 700,000 tons of bituminous reached British ports from the United States. With British miners leaving the pits in growing numbers for defense and white-collar jobs, the shortage there is not likely to end with the coming of spring, he said.

Though ECA aid to Britain will end Dec. 31, 1950, ECA now is reviewing European coal requirements with a view to advancing dollars to keep vital industries going during the winter. No allocations have yet been made for this purpose, however. As long as foreign purchasers of American coal use their own free dollars, they may ship in vessels of their own choosing but when ECA dollars are used, at least half the coal must move in American ships, Mr. Estes explained.

Meanwhile, the United Nations Economic Committee for Europe, viewing the growing shortage of coal, could agree only to "equalize the dissatisfaction." Officials expressed the belief that the United States would not be able to meet the demand for American coal with the shipping available. They expected that little more than 2,000,000 tons could be shipped across the Atlantic in 1951. In the first 9 mo of 1950, American exporters shipped only 284,000 tons to European destinations.

Featured in This Section

News in Brief....p 116
New Mine Developments....p 118
Coal and Business Activity....p 118
Kentucky Mining Institute....p 121
AIME-W. Va. Joint Meet....p 122
Illinois Mining Institute....p 124
Personal Notes....p 126
Obituaries....p 128
Preparation Facilities....p 130
Association Activities....p 132
New Book for Coal Men....p 132
Among the Manufacturers....p 134
Foreign Developments....p 138

Connor Named to Head SFA; Klett Anthracite Deputy

Charles W. Connor, until recently in charge of coal-mining operations, Armco Steel Corp., Montcoal, W. Va., was named Dec. 7 as administrator, Defense Solid Fuels Administration. The following day Edward T. Klett, Washington representative, Anthracite Institute, was made deputy administrator for anthracite.

The SFA is one of five new defense agencies set up under direction of Interior Secretary Oscar L. Chapman. Other agencies are the Petroleum Administration for Defense, the Defense Minerals Administration, the Defense Power Administration and the Defense Fisheries Administration.

Mr. Connor recently has been serving as consultant to Secretary Chapman in the formation of SFA. To his new defense position, he brings wide experience in mining, producing and distributing coal. Prior to joining the Armco Steel Corp., he was superintendent, Solvay Colliery Co., Maryton, W. Va., and from 1918 to 1927 was general manager, E. R. Smith Coal Co., Esco, Ky.

Mr. Klett will have charge of production and distribution of anthracite. Before becoming Anthracite Institute's Washington representative in Sept., 1950, he had held various executive offices and directorships with the Haddock mining interests in deep and strip mining as well as preparation. Earlier, in 1920, he was employed as assistant treasurer, Alden Coal Mining Co. While with the Haddock companies, and later with the W. H. Bradford Co., he was engaged in buying and selling anthracite and bituminous in the Hudson River valley and the New England states.

Mr. Connor, the new administrator, planned to move swiftly in setting up his organization. Though there is no immediate shortage of coal in sight, he said he wants to ease equipment and transportation bottlenecks so production will flow smoothly.



New Anthracite Heater Built for Larger Units

A new anthracite unit that is designed to give oil burners a real battle for the larger automatic heating market is now being produced by the Axeman-Anderson Co., Williamsport, Pa. Called the 260M Axeman-Anderson Anthratube, the new 100% automatic unit is expected to provide savings as high as 50% for larger private homes, schools, hotels and apartment buildings, etc., the manufacturer reports.

Thoroughly tested in the company's laboratory and approved by the Anthracite Institute, the 260M unit has also been field-tested heating actual buildings over the past 2 yr. It is a larger version of the home-sized Anthratube that has been on the market for the past 3 yr. The new unit automatically takes anthracite from the bin, burns it and shakes the ashes into a container or pit.

How to Get Your Copy of COAL AGE'S 1950 Index

THE ANNUAL INDEX TO COAL AGE, Vol. 55, January to December, 1950, now is being prepared and will be available shortly to all subscribers on request. A three-way analysis of 1950 issues, the index classifies all editorial articles by subject, by mine and company and by author. Subscribers who have occasion to refer to past issues will find it a very helpful addition to their file of COAL AGE copies. To request a copy, indicate that you would like the 1950 Index on the postage-free card opposite p 112 if you use this card to secure new equipment data; or, address a penny postcard to The Editor, COAL AGE, 330 W. 42nd St., New York 18.

News in Brief

NCA to Honor Safe Foremen

The Safety Division of the National Coal Association is again planning to award certificates to mine supervisors who have attained unusual safety records, particularly in 1950. More than 1,000 foremen were honored by the association last year for having no lost-time accidents in their sections during 1949. Application blanks for determining the foremen in that category in 1950 have been mailed to company safety directors and the NCA also is interested in knowing of mines that operated without accident in 1950.

Anthracite Producers Use TV

Both The Hudson Coal Co. and the Philadelphia & Reading Coal & Iron Co. recently announced that they had contracted for a series of television spot announcements in their marketing areas. P. & R.'s program calls for 29 telecasts a week on a 52-wk basis and the use of 11 stations. Hudson Coal has instituted a test campaign for 26 wk and sponsors a total of five announcements a week over two upper New York state stations.

PMWA Asks New Negotiations

Officials of the Progressive Mine Workers of America announced early in December that they had asked the Illinois Coal Producers' Association to re-open contract negotiations as a result of recent increases in the cost of living. No operator reaction was immediately available and the union would not comment on its possible demands. The PMWA contract runs to June 30, 1952, but contains provisions for re-opening.

Frick Sells Company Houses

Sale by the H. C. Frick Coke Co. of 2,716 company houses in 14 towns in a 15-mi radius of Uniontown, Pa., was reported last month. The homes were acquired by John W. Galbreath, Columbus, Ohio, realtor, who said that he planned to rehabilitate the homes and offer them for sale to Frick employees. Last summer, Mr. Galbreath took over a large number of T. C. & I. company-owned houses and is now engaged in modernizing them for sale to employees. Modernization of the Frick houses is expected to take some months and will include the installation of electricity, bath and toilet facilities, interior and exterior repairs and community improvements. While the sale price was not disclosed, the properties will have a value of $4 to $5 million when the work is completed, the new owner said.

News of Your Company Is Welcome, Too!

MANY COAL-MINING COMPANIES make it a point to write us personal changes on their staff for inclusion in COAL AGE'S "Personal Notes" section, as well as other news of their company, such as new mine developments, safety and production achievements, annual staff functions, etc., accompanied by pictures where suitable and available. You, too, are invited to write us whenever the occasion arises—it takes only a minute. Job changes from the individuals concerned also are welcome. Address: News Editor, COAL AGE, 330 West 42nd St., New York 18, N. Y.

First Lignite Lab Completed

The new USBM $750,000 lignite laboratory at Grand Forks, N. D., is now completed and ready for occupancy. The first laboratory to be built exclusively for lignite research, the new building provides complete facilities for studying methods of increasing the use of lignite for power, heat and other purposes. Vast lignite reserves are available for development in the West.

Canada to Build Gas Turbine

McGill University will build an experimental coal-burning gas-turbine locomotive engine under an agreement with the Canadian government, which will finance the project, it was announced Dec. 12. The unit will be a stationary engine, about one-sixth actual size and developing 500 hp which is about one-eighth the horsepower of a full-size locomotive engine. It is expected to lead to the design of a full-scale engine for use on Canadian railroads.

British Coal Industry Defeated

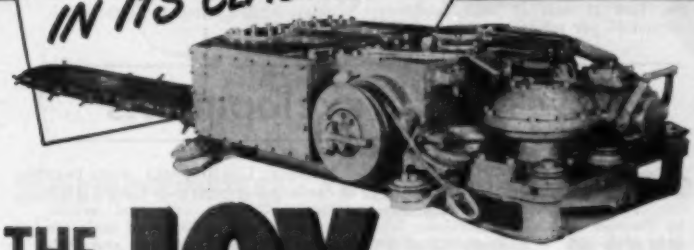
The British Labor government Dec. 12 defeated a Conservative motion in the House of Commons calling for an impartial inquiry into the country's coal shortage. The government stopped the inquiry by a margin of 14 votes. Earlier, it was reported that the introduction of Saturday work in a number of mines throughout the country has resulted in an increase of 270,000 tons mined over the previous week.

Illinois Power Plant Open

The new Ridgeland generating plant of the Commonwealth Edison Co., Stickney, Ill., about 25 mi southwest



EASIEST HANDLING THIN-SEAM CUTTER IN ITS CLASS!



The JOY Bugduster operates on a non-clogging principle which permits passing large objects such as bits, slate and cap pieces. It eliminates kerf shoveling—frees one man for other duties. What's more, it requires no extra power—operating records show that keeping the cutter chain free of cuttings saves enough power to drive the bugduster.

THE JOY 11-B CUTTER with BUGDUSTER



Only JOY Shortwall Cutters offer lever control for smooth operation of drum friction clutches. The JOY 11-B Cutter with Bugduster handles easily and smoothly, cuts faster and also saves time in the loading cycle, because the cuttings are piled in an even row for easier mechanical loading. With this cutter, props can be carried close to the face—its short length, low height and narrow width make it the ideal cutter for conveyor mining. On any basis of comparison in its class, the JOY 11-B Cutter with Bugduster will pile up extra profits for you—*let us show you actual performance figures!*

Write for Bulletins or

Consult a Joy Engineer



WBD-CL2840

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

of Chicago, was dedicated Dec. 7. The new plant, which cost an estimated $70 million and has been under construction for 3 yr, will use about 1,500 tons of coal a day, or about 9 million tons annually. Its first unit now in operation has a capacity of 150,000 kw. A second unit is scheduled for completion this summer and a third in 1953.

L. & N. Buys Diesels

The Louisville & Nashville R.R. has placed an order for $8,000,000 worth of diesel locomotives, the third order placed by the line in recent months, it has been reported. Much of the new equipment will be used in coal areas and first deliveries are expected to begin in April.

Peabody Mines Set Record

Mines of the Peabody Coal Co. Nov. 30 produced the greatest single day's tonnage in the company's history when they mined a record 70,909 tons of coal. It was the second time within a month that Peabody production records had been broken, officials reported. The tonnage increase prevailed throughout Peabody's 13 mines, with practically all of them showing production in excess of that estimated. The record was set in spite of the fact that the company's new Mine No. 17, at Pana, which is now under construction produced only 5,500 tons of its eventual capacity of 9,000 tons.

Coal Company Earnings

Coal-company earnings and dividend announcements recently reported include:

Truax-Traer Coal Co. and subsidiaries—6 mo to Oct. 31, net income of $2,102,048, equal to $1.90 a share on sales of $27,571,489, as against $111,403 or 11c a share in 1949 on sales of $11,169,140.

West Virginia Coal & Coke Corp.—Declared a dividend of 30c and a year-end distribution of 50c a share payable to holders of record Dec. 1.

Peabody Coal Co.—6 mos to Oct. 31, net profit of $1,116,589, equal to $1.11 a share, compared to a loss of $331,092 after a tax credit of $363,000 in the same period of 1949.

Pittsburgh Consolidation Coal Co.—Declared a quarterly dividend of 75c a share payable to stock of record Dec. 1, restoring the former $3 annual rate. Dividends had been 50c for the three previous quarters.

Safest Anthracite Year Seen

The anthracite industry is on the way to the best safety record in the history of world mining unless a major disaster should occur during the latter part of December, Joseph J. Walsh, Pennsylvania Deputy Secretary of Mines, reported Dec. 13. For the first 11 mos of 1950, fatalities were 0.67 per million man-hours.

New Anthracite Booklet To Help Dealers Sell

A new booklet which tells prospective customers the story of modern, automatic anthracite equipment now is available for use by dealers and heating contractors in their merchandising activities, Edward H. Walker, vice president in charge of public relations for the Anthracite Institute, announces.

The booklet is titled, "How to Be More Comfortable and Save with Automatic Hard Coal Heat." Its central story tells how stokers, Anthratubes and the Anthra-flo perform for the consumer and bring them today's modern anthracite convenience and comfort. Testimonials from home owners and Randolph Evans, leading architect, support this consumer message.

It stresses anthracite's advantages of convenience, "fuel bills cut in half," its cleanliness, smokelessness and the fact that a full year's supply can be stored. Anthracite's current theme of helping to ward off colds and other winter ills is also featured in the booklet, with statements from health authorities.

New Mine Developments

Acquisition of the Northern Illinois Coal Corp. by the Southern Coal Co., Inc., Chicago, was recently announced by Thomas C. Mullins, Northern Illinois president, who reported that he and William C. Griffith, of Indianapolis, and other principal stockholders had contracted for the sale of their stock on the basis of $36 a share.

Northern Illinois Coal's mines have a combined production of more than 4,000,000 tons annually and include the Sunlight and Tecumseh mines in Indiana and the Seminole and Wilmington mines in Illinois. The company will continue to operate as in the past and no change in personnel or policies is planned, according to an announcement by L. R. Kelce, president of the Southern Coal Co., Inc. Present plans also call for no change in the sales and distribution of coal produced by Northern Illinois in Illinois and Indiana, according to S. L. Jewell, vice president and director of sales for Southern Coal.

The Valley Camp Coal Co. has purchased the Sarah Furnace mine of the Keystone Mining Co., near East Brady, Clarion County, Pa. The mine, which has been inactive since the end of October, had been operated for 45 yr by the keystone organization, a subsidiary of the D. L. & W. R.R. The railroad's dieselization program was cited as the reason for the sale of the property.

The new Silver Splint mine of the Dartmouth Coal Co., Evarts, Ky., is currently producing 600 tpd and is expected to reach full capacity of 1,500 tpd by May, it is reported. The drift operation is completely mechanized and is planned for a life expectancy of 30 yr. The High Splint seam is being mined and shipments are made via the L. & N.

(*Continued on page 126*)

What's Happening to Coal and Business Activity

Coal Production		1950 to This Date	1950 Over 1949, to Date
Est. anthracite prod., week ending Dec. 9	751,000	41,982,000	+ 2.2
Est. bituminous prod., week ending Dec. 9	11,420,000	474,227,000	+14.9

Source: U. S. Bureau of Mines.

Bituminous Coal Stocks (Thousands, net tons)	Nov. 1, 1950	Days' Supply	Oct. 1, 1950	Nov. 1, 1949
Electric power utilities	26,668	101	24,940	19,706
By-product coke ovens	15,637	37	13,964	10,101
Beehive coke ovens				
Steel and rolling mills	980	30	960	899
Cement mills	1,283	56	1,181	1,044
Other industrials	18,936	69	17,137	9,999
Railroads (Class I)	4,172	24	3,646	4,170
Retail dealers	2,764	14	2,457	1,410
Total	70,449	35	64,293	47,329

Consumption (Thousands, net tons)	Oct., 1950	Sept., 1950	Oct., 1949
Electric power utilities	8,186	7,456	6,279
By-product coke ovens	8,484	8,037	2,442
Beehive coke ovens	984	903	17
Steel and rolling mills	611	553	276
Cement mills	705	652	643
Other industrials	8,560	7,609	7,378
Railroads (Class I)	5,360	4,972	4,584
Retail dealers	5,905*	6,755*	6,499*
Total	38,675	36,957	28,121

Source: U. S. Bureau of Mines. *Retail dealer deliveries.

	Latest Week*	Month Ago	Year Ago
Business Week Index of Business Activity, wk. ending Dec. 16	228.6	220.9	190.6
Steel ingot operations (% of capacity)	100.0	102.7	94.5
Electric power output (million kw-hr)	6,985	6,738	5,997
Crude oil production (daily avg., 1,000 bbl)	5,723	5,882	5,009
Misc. & L.C.L. carloadings (daily avg., 1,000 cars)	77	82	68
All other carloadings (daily avg., 1,000 cars)	51	56	43
Prices, spot commodity index (Moody's, Dec. 31, 1931 = 100)	498.9	485.3	346.0
Prices, industrial raw materials (B.L.S., Aug., 1939 = 100)	351.0	339.0	223.1
Prices, domestic farm products (B.L.S., Aug., 1939 = 100)	374.3	359.1	297.0
Prices, finished steel composite (*Iron Age*, lb)	4.131c	3.837c	3.835c
90 stocks, price index (Standard & Poor's Corp.)	156.4	156.2	131.8

*Date of latest week for each series on request.

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Something *NEW* has been added to SK DEPENDABILITY

You know the SK motor as the most dependable d-c motor in the business. Thirty-nine years of tough, rugged service have proved it. Now, retaining all the basic features of the old SK, we've added something new to bring new value to d-c motor users.

CAST BRASS BRUSHHOLDERS . . . are noncorroding. May be removed individually through spacious front openings. Stainless steel spring retains constant tension on brush.

MELAMINE ROCKER RING . . . is noncarbonizing when arcs occur across its surface. There's no tracking effect . . . no "burned in" paths to cause shorts that reduce motor efficiency.

PRE-LUBRICATED BALL BEARINGS . . . need no lubrication. Eliminate trouble and cost of greasing attention. Dirt stays out . . . grease stays in.

REINFORCED END BRACKETS . . . provide maximum rigidity, strength and correct bearing alignment . . . stand up to the shocking, jarring blows so often encountered in rugged d-c service.

SNAP-ON COVERS . . . eliminate screws and bolts. Stainless steel spring clips allow covers to be snapped on easily. To remove, just pry off with a screw driver.

TUFVAR WIRE . . . adds life to armature. Tougher, more flexible than conventional enamel, it stands up to long heat exposure . . . shows no tendency to crack or become brittle.

TAKE A MOTOR APART AND SEE. Ask your Westinghouse representative to show the Life-Line D-C Motor "Transvision". It takes a motor apart and puts it together again on your own desk top. You'll see the inside story of SK dependability . . . see why something new has been added. Call your local representative today. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-21550

Westinghouse *Life-Line* D-C Motors

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SIMPLEX Re-Mo-Trol

with the Famous Simplex *Center Hole* Ram*

GREATER SAFETY
GREATER UTILITY
GREATER CONVENIENCE
...Hundreds of Uses in All Kinds of Industry!



7 Complete Units . . .
Broadest Capacity Range in the Field . . .
10 to 100 Tons

Now, meet the "jack-of-all-trades" that is *master* of them all—SIMPLEX Re-Mo-Trol—the newest member of the world's best known family of industrial jacks! It's an efficiency-tool that makes hard lifting — pulling — pushing — bending — straightening — or pressing jobs easier. A tool that assures new safety by remote control and works with full effectiveness where lack of space stymies self-contained jacks or pullers.

Re-Mo-Trol applies oil-smooth hydraulic force in any direction . . . up, down, sideways, or at any angle. It is light in weight . . . easily portable . . . handles unusual jobs with *minimum* need for specialized attachments—thanks to the famous Simplex "Center Hole."* It is ideal not only for shop use, but for all kinds of applications in the field—in mining, construction . . . anywhere that heavy loads must be moved or pulled efficiently, safely and at low cost in time and labor.

Get complete information on Re-Mo-Trol from your Simplex Distributor today. Or write direct for Bulletin: Hydraulic No. 50.



Pulling valve seats with Re-Mo-Trol. "Center Hole" provides torque-free pull that takes less effort, is more positive.

RE-Mo-Trol shines in close-quarters pushing like this!

NOTE: In addition to 7 Complete Re-Mo-Trol Units and a broad selection of optional accessories, you can purchase individual Re-Mo-Trol Pumps and Rams separately.

Simplex
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Jacks

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1040 South Central Avenue • Chicago 44, Illinois

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More trips with full load whether roads are good or bad—that's the contribution of Eaton 2-Speed Axles to greater truck operating profits. Eaton 2-Speeds have double the conventional number of axle gear ratios. As a result, the tremendous power of today's engines is utilized to best advantage—speed for good roads . . . pulling capacity under full load for tough spots. Regardless of driving conditions, faster trips are the rule—without sacrificing payload. This ability to haul more is the reason that Eaton Axles pay for themselves over and over.

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Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

This Is Really One For The Book!



FEW PEOPLE would expect a blasting cap plant to be one of the safest places to work. Yet Atlas workers, on December 6, 1950, completed five years of making Manasite blasting caps and electric blasting caps without a single lost-time injury! During this period, they produced well over 250,000,000 of these detonators.

The last injury serious enough to send an employe home from work, five years ago, was a wrenched back. The one before that, a bruised ankle. In fact, no lost-time injury has been caused by an explosion in the plant since Atlas converted to Manasite blasting caps and omitted fulminate of mercury as an ingredient in these products some twelve years ago.

Little did anyone realize, then, the new degree of safety which would be made possible in the plant, as well as in the quarries, mines and construction jobs where blasting caps are used. Thanks to pioneering by Atlas research, engineers and experienced production employes, the safety of making and using blasting caps has made a great forward stride. Manasite detonators give greater effectiveness to the safety precautions which must always be followed in handling explosives.

Manasite is typical of Atlas contributions to safer, more effective, and more economical blasting. That's why you can expect to get the *right* answers to blasting problems from Atlas—originator of Manasite detonators and the famous ROCKMASTER "16" Blasting System.

Rockmaster and Manasite: Reg. U. S. Pat. Off.

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***INDUSTRY MEETING*—A Special Coal Age Staff-Written Report**



OPENING SESSION—standing: A. D. Sisk (left), chief, Kentucky Department of Mines & Minerals; Sterling S. Lanier Jr., president, Norton Coal Corp.; M. C. McCall, engineer in charge, U.S. Bureau of Mines, Birmingham; and J. S. Malesky, mining-explosives engineer, U.S. Bureau of Mines, Norton, Va.; seated: H. M. Gallaher (left), superintendent, Harvey Coal Corp.; Davis Read, mining consultant; L. I. Cothern, director of engineering, Jewell Ridge Coal Corp.; H. E. Knight, preparation engineer, Ball & Zoller Coal & Mining Co.; and G. O. Tarleton, vice president, Consolidation Coal Co. (Ky).

Kentucky Institute Discusses Varied Mining Subjects

Latest Developments in a Wide Range of Operating, Management and Research Activities Highlight 14 Papers Presented at the 11th Annual Meeting of the Kentucky Mining Institute



SATURDAY SPEAKERS—A. J. Bartlett (left), personnel director, Pond Creek Pocahontas Co.; Gerald Von Stroh, director, mining development, Bituminous Coal Research, Inc.; and Joseph Richards, engineer, Leatherwood mine, Blue Diamond Coal Co.

FLEXIBLE-SHAFT DRILLS, auger mining, air breaking, roof bolting, wood pinning, mining education, the BCR Mining Development program, safety and recovery operations, labor management, time studies and geology were subjects covered by 14 papers presented at the 11th annual meeting of the Kentucky Mining Institute, Lexington, Nov. 10-11. H. M. Gallaher, superintendent, Harvey Coal Corp., was elected president succeeding Davis Read, mining consultant, Madisonville, Ky. Sessions were well attended and the banquet, with O. W. Evans, general manager, N. & W. Fuel Department as toastmaster had a full house of 350 members and guests. The program was arranged by C. H. Hodgson and R. L. Smith, Mine Safety Appliances Co.

Kentucky Institute Officers

President—H. M. Gallaher, superintendent, Harvey Coal Corp., Harveyton.

First vice president—F. P. Kerr, general manager, Eastern Coal Corp., Stone.

Second vice president—L. P. Johnson, vice president, Crummies Creek Coal Co., Crummies.

Third vice president—S. M. Cassidy, president, Consolidation Coal Co. (Ky), Div. of the Pittsburgh Consolidation Coal Co., Jenkins.

Secretary-treasurer—A. D. Sisk, chief, Kentucky Department of Mines & Minerals, Lexington.

Flexible-Shaft Drilling—Latest improvements in flexible shafts to drive drills and auxiliary equipment from the mining-machine motor were described by A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., Johnstown, Pa. Start of this development goes back 5 yr when, in the company's mine in Nicholas County, W. Va., a man was killed by electric shock while operating a hand-held electric coal drill. Aside from the safety features, the flexible-shaft drills have greatly increased drilling speed and contributed to reducing cost of coal (*Coal Age*, July, 1949, p 84; August, 1950, p 78).

The flexible-shaft drill has been adapted to drilling top for roof bolts and in Crichton No. 4 mine some 3

(*Continued on p 142*)

Two Groups Hold Joint W. Va. Meet

New Low-Cost Method of Cable Splicing in Mine Section, BCR Continuous-Mining Unit, Stainless-Steel Belts, New-Type Safety Approach and Roof-Bolting Panel Top Features at Joint Meeting of AIME Central Appalachian Section and West Virginia Coal Mining Institute

DEMONSTRATION OF A METHOD of making permanent cable splices in the mine section in 20 min at a cost of $1.50 and a panel discussion of roof bolting were among the highlights of the joint meeting of the Central Appalachian Section, AIME and West Virginia Coal Mining Institute, held at the Greenbrier Hotel, White Sulphur Springs, W. Va., Nov. 25-26. The BCR continuous-mining machine, stainless-steel belts and a new safety approach rounded out the program. The big snow which blanketed White Sulphur with approximately 20 in prevented the appearance of some of the speakers and officers and made it necessary for some of those in attendance to leave their cars and proceed home by train.

C. R. Bourland, assistant to the vice president, New River Co., Mt. Hope, W. Va., was elected president of the West Virginia institute, and J. T. Parker, superintendent of mines, Inland Steel Co., Wheelwright, Ky., was elected chairman of the Central Appalachian Section. Chairmen of technical sessions were A. D. Sisk, chief, Kentucky Department of Mines & Minerals, and R. H. Morris, vice president, Gauley Mountain Coal Co., Ansted, W. Va. Wm. A. Staab, mining engineer, Calcium Chloride Association and retiring chairman of the section, presided at the dinner. George R. Higinbotham, vice president—operations, Consolidation Coal Co. (W. Va.), Div. of Pittsburgh Consolidation Coal Co., and retiring president of the West Virginia institute, served as toastmaster, and J. D. Battle, executive secretary, National Coal Association was the guest speaker.

Cable-Splicing Method — Chester Conrad, assistant maintenance superintendent, Consolidation Coal Co. (W. Va.), Monongah, presented the paper and demonstration on the improved cable-splicing method for trailing cables. The insulation and jacket, composed of Plastisol vinyl thermo plastic which is squirted into a mold, is cured by heating to 350 deg F for only 5 min. Conductors are spliced with Cadwell copper-thermit No. 25 cartridges. The completed cable splices have maximum tensile strength, are very short and quite flexible. The complete splicing equipment is carried on a small rubber-tired push cart. This rapid method, together with a light weight portable equipment, is the result of research by the Consolidation Coal Co. (W. Va.), which 15 mo ago employed a consulting chemist to attack the cable-splicing problem. (See p 70 of this issue for full details of this development.)

"Single Objective Safety," which has accomplished great improvement for the Carnegie-Illinois Steel Corp., was described in a graphically illustrated presentation by E. M. Moore, vice president in charge of industrial relations, assisted by Dan Ferrell, supervisor of safety, and William Jones, supervisor of education. In the single-objective approach, the basic principles are: (1) get the facts, (2) spot the critical situations, (3) single out objectives and (4) take action.

To spot critical situations, an awareness chart is prepared for each department from reports of all injuries made by foremen. Causes for each occupation are spotted, and a control chart shows if objectives have been achieved or if certain activities need further study.

The three C's of safety, the paper mentioned, are: comprehension, contact and control. In analysis, every subject is reduced to simplest terms. For example, contact with objects is divided into three parts: (1) caught between, (2) struck against and (3) struck by.

Some 2 yr ago, the company decided to stimulate safety on a community basis and made a start in the public schools, with the result that today safety is permanently on the curriculum. A student's manual, film strip and instructors' guide were prepared and supplied to the schools. The first move in the program was to teach safety in wood-working classes.

Continuous mining, as being worked out by the Mining Development Committee of Bituminous Coal Research, Inc., to date, was explained by Gerald Von Stroh, director. Using detailed photographs projected on the screen, he showed the construction of Test Unit No. 2, which was scheduled to be given a service test in a mine beginning about the middle of December.

He also described another development of the committee, the shaking "squirt-rule" conveyor, which is designed to provide uninterrupted transportation from an advancing continuous-mining machine. The unit has been shipped to a mine for trial.

Stainless-Steel Conveyor Belts— Pinch hitting for W. B. Jamison, chief engineer, and James Riding, preparation engineer, Jamison Coal & Coke Co., and for A. B. Crichton Jr., vice president, Johnstown Coal & Coke Co., all of whom were unable to get to the meeting, Mr. Von Stroh discussed the application of stainless-steel conveyor belts. In opening, he mentioned a few of the advantages of steel belting, compared to rubber, as

(Continued on p 156)

INDUSTRY MEETING
—A Special Coal Age Staff-Written Report

New Officers

West Virginia Mining Institute

President—C. R. Bourland, assistant to the vice president, New River Co., Mt. Hope.

Vice president—James F. Trotter, president and general manager, Trotter Coal Co., Morgantown; Arch J. Alexander, chief, W. Va. Department of Mines, Charleston; H. A. Quenon, division manager, Eastern Gas & Fuel Associates, Grant Town; R. C. Luther, vice president, Peerless Coal & Coke Co., Vivian; C. E. Hough, vice president and general manager, Imperial Smokeless Coal Co., Quinwood.

Secretary-treasurer—G. R. Spindler, director, School of Mines, West Virginia University, Morgantown.

AIME Central Appalachian Sec.

Chairman—J. T. Parker, superintendent of mines, Inland Steel Co., Wheelwright, Ky.

Vice chairman—Fred K. Prosser, general coal traffic manager, Norfolk & Western Ry., Roanoke, Va.; G. R. Spindler, director, School of Mines, West Virginia University, Morgantown, W. Va.; George R. Higinbotham, vice president operations, Consolidation Coal Co. [W. Va.] Div. of Pittsburgh Consolidation Coal Co., Fairmont, W. Va.

Secretary-treasurer — Charles T. Holland, director, Mining Engineering, Virginia Polytechnic Institute, Blacksburg, Va.

HAZARD'S 3 POINT IMPROVEMENT

IN HAZACORD TWIN PARALLEL MINING MACHINE CABLE SETS NEW STANDARDS FOR

- **SAFETY,**
- **SERVICE LIFE,**
- **FLEXIBILITY**



■ **INCREASED SAFETY.** See how tough, flame-resistant Hazaprene ZBF Sheath completely encases each insulated conductor, forming a solid Hazaprene barrier between the power and grounding conductors in Type G, and between the power conductors in Type W. This new separating wall prevents short-circuiting . . . adds substantially to the cable's overall flame-resistance. Internal shifting of cable components is eliminated because the interlocking construction of insulated conductors, grounding conductor, reinforcing cord and Hazaprene sheath forms one integral mass.

■ **EXTENDED SERVICE LIFE.** Notice the non-rotting, non-wicking moisture-resistant open braid cord over each insulated conductor. This reinforces the heat-resistant long-aging rubber insulation and is firmly bonded to the conductors . . . and locks the insulated conductors within the sheath.

■ **GREATER FLEXIBILITY.** Note the flat, braided grounding conductor which permits compact cable design for maximum reel capacity . . . provides complete flexibility without strain for the highest speed reeling applications.

Forget whatever you've learned to expect in the way of cable life and all-around performance from twin parallel mining machine cable in shuttle car service or other fast-reeling applications. You can set your sights higher with Hazard's new Type G or W. And in addition to the "inside" improvements described above, don't forget the "outside" advantages you get with the Hazaprene ZBF Sheath. This tough, Hazard-developed neoprene compound combines greater flame-resistance and durability than was ever before possible. Hazacord Twin Parallel Mining Machine Cable exceeds the flame-test requirements of the U. S. Bureau of Mines and Pennsylvania Department of Mines—"P-104 BM" is molded into the sheath of every cable at frequent intervals.

Write today for further information about the new Hazard twin parallel cable or ask your Hazard representative. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

HAZARD

***INDUSTRY MEETING*—A Special Coal Age Staff-Written Report**



ROOF BOLTING, CONTINUOUS MINING AND SAFETY—W. J. Phillips (left), Sunnyhill Coal Co.; S. H. Ash, USBM; C. C. Conway, The Consolidated Coal Co., session chairman; Earl R. Maize, NCA; L. W. Kelly, USBM; and John Williamson Jr., Peabody Coal Co.



NEW IMI PRESIDENT—G. Stuart Jenkins, vice president and general manager, The Consolidated Coal Co.

Illinois Scans Coal-Mining Progress

ROOF BOLTING, safety, electrical controls in a preparation plant and various types of alloy steels useful in coal mining were major subjects at the 58th annual meeting of the Illinois Mining Institute, Springfield, Ill., Nov. 17. Over 750 coal-company officials, practical mining men and manufacturers' representatives registered for the one-day conference.

At a short business session preceding the technical program, with T. G. Gerow, executive vice president, Truax-Traer Coal Co., Chicago, and retiring institute president, presiding, H. L. Walker, head, Department of Mining & Metallurgical Engineering, University of Illinois, reported as follows for the institute's scholarship committee: academic year 1949-50, total students enrolled in the state university system, 19,000; engineering students, 3,034; mining-engineering students, 96; in 1950-51, total enrolled, 17,000; engineering students, 2,205; mining-engineering students, 79. Sixteen of the 79 enrolled in the current year hold scholarships, he stated. Dr. Walker attributed the decline in student enrollment to (1) low birth rate in the early '30s, (2) decrease in students drawing G.I. benefits, (3) mistaken advice by high-school principals, who believed engineering was overcrowded, and (4) the effect of military draft on young men now of college age.

Out of a group of 250 graduates in mining engineering in 1950, 130 have taken up work in coal mining, said M. D. Cooper, director, vocational training and education, National Coal Association, who commented on Dr. Walker's report. Mr. Cooper urged coal companies to establish more scholarships for engineering training, especially for the sons of their employees, and stated that $500 plus a guarantee of summer work in the mines is adequate for a scholarship. Such a program, he argued, would help better labor and public relations for the company and the industry.



CLEANING-PLANT CONTROLS AND MINING STEELS—T. L. Garwood (left), C. W & F Coal Co., session chairman; George J. Reynolds, Morgan Mines, Inc.; and Carnegie-Illinois speakers: C. H. Jackman, R. C. Altman, R. M. Stodgell and C. H. Purnell.

Roof bolts have been installed in over 350 coal mines to secure some 800 mi of mine roof within the last 2 yr, declared J. J. Forbes, chief, Health & Safety Division, U.S. Bureau of Mines. Mr. Forbes' paper, supplemented by a Bureau film on

(*Continued on p 168*)

New Officers
Illinois Mining Institute

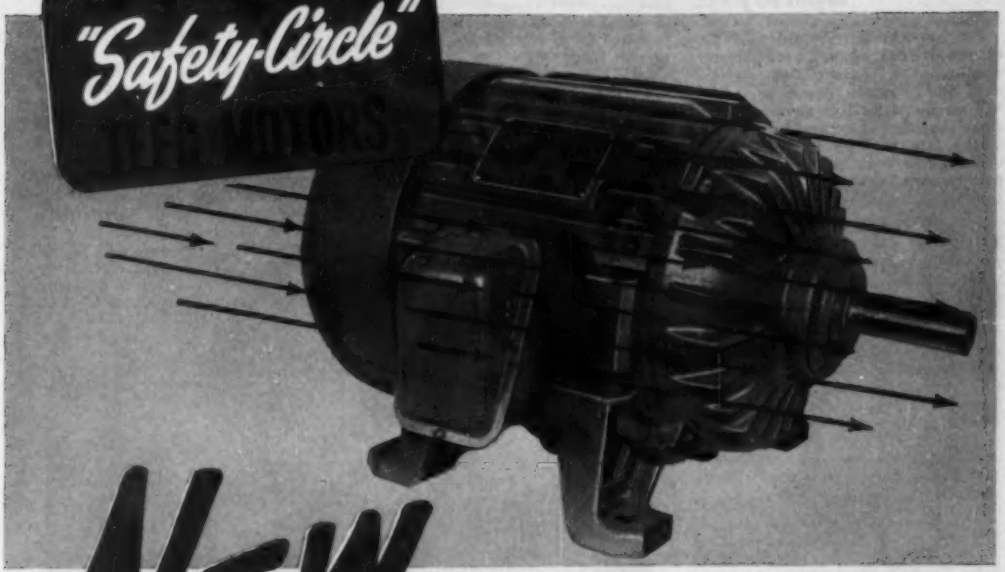
President—G. S. Jenkins, vice president and general manager, The Consolidated Coal Co., St. Louis, Mo.

Vice president—Clayton G. Ball, Paul Weir Co., Chicago, Ill.

Secretary-treasurer—B. E. Schonthal, Chicago, Ill.

Executive Board, 3-yr term—William Bolt, Freeman Coal Co.; F. E. Snarr, Chicago, Wilmington & Franklin Coal Co.; Frank L. White, Peabody Coal Co.; and H. C. Woods, Sahara Coal Co.

Executive Board, 2-yr term—Walter Eadie, Illinois Department of Mines & Minerals.



NEW Easy to Clean Protected From Dirt

THIS NEW *Safety Circle* totally-enclosed, fan-cooled motor cannot clog with dirt. The ribbed cooling surfaces are outside the motor. There are no pockets or crevices where dirt can collect. Cooling air is not enclosed at any point except the fan cover.

Cleaning is the simplest of maintenance operations done in a few seconds with an air hose. The fan cover also can be removed very quickly for a thorough cleaning.

Factory Lubricated Bearings

Bearings are lubricated at the factory and operate without attention or cost for years. The frame of this *Safety Circle* TEFC motor is cast iron, inherently corrosion resistant, strong and rigid. The extra rigidity of the cast iron frame holds the bearings in true alignment under severe operating conditions. This gives long bearing life and low operating costs.

Get All The Facts

The new *Safety Circle* totally-enclosed fan-cooled motor is built in all NEMA standard frame sizes from 224 to 505. Your Allis-Chalmers Authorized Dealer or Sales Office has complete information. Call today or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B6144. A-3338

Safety Circle, *Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.





PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

ALLIS-CHALMERS

New Mine Developments

Begins on p 118

The Northwestern Improvement Co. reportedly has begun work on the opening of a haulage slope for its new No. 10 mine. The slope, which will parallel a 2,400-ft manway begun some time ago, is expected to be completed late this year. The No. 10 operation is near the company's No. 9 mine and its coal will be shipped over the No. 9 tipple.

Re-activation of the 40-yr-old New River Coal Co. as a mutual sales agency handling both high- and low-volatile coals on a national scale recently was reported. The company will have its main office in Slab Fork, W. Va., with district offices in Richmond, Va., and Cincinnati, Ohio. It will act as agent for the Slab Fork Coal Co., Gaston Coal Co., Scotia Coal & Coke Co., Princess Dorothy Coal Co., Ridgeview Coal Co. and Chafin Coal Co. S. Austin Caperton Sr. is president of the organization, Andrew O'B Hogue, vice president, and H. D. Butterworth, secretary.

The Leckie Collieries Co. and its affiliate, the Leckie Smokeless Coal Co., is planning to open offices in Bluefield, W. Va., consolidating the offices now maintained in Huntington and Charleston, W. Va., and Columbus, Ohio. The move is planned to take place about March 1.

A new strip-mining operation with annual output of 100,000 to 150,000 tons is being planned by the newly incorporated Lakeland Coal Corp. of Cleveland. The company has leased coal lands near Cadiz, Ohio, according to Salvatore DiBartolo, one of the incorporators, who is acting as an agent for the firm.

Jones & Laughlin Steel Corp. has contracted with the Shaft & Tunnel Department of the Dravo Corp. for the construction of a new 175-ft ventilating shaft at its Shannopin mine. The concrete-lined shaft will have inside dimension of 12½x35 ft.

Woodward Iron Co., Birmingham, Ala., reportedly has begun a $1,000,000 program that will provide for complete mechanization of its Mulga mine and increase its output by about 25%. Plans call for the installation of a new slope belt to replace the present shaft and the introduction of continuous mining units, larger mine cars and other equipment. The mine produced 462,392 tons in 1949 and operated at an annual rate of 600,000 tons in 1950.

The T. & L. Coal Co., St. Clairsville, Ohio, last month reportedly brought its recently opened strip mine up to full capacity of 750 tpd. The operation, which is planned for a life expectancy of 10 yr, mines the No. 8 and 8A seams, shipping via the Nickel Plate R.R.

The Alabama Fuel & Iron Co., which at one time produced over a million tons annually, last month announced the closing of its Margaret mine, the last of the three operated by the company. Prince DeBardeleben, company president, said the rising production costs had "priced coal out of the market."

The Raleigh Coal & Coke Co., Raleigh, W. Va., is reported to have ceased operation for an indefinite period. Known as the oldest producing company in Raleigh County, the company has operated up to a half dozen mines at one time and has produced more than 25 million tons since its establishment in 1898. In making the announcement, the company said that virtually all minable and salable coal in its 8,000-acre lease had been removed and that the lease would be surrendered to the Beaver Coal Corp. The company's mine had been producing about 1,200 tpd at the time of the closing.

MEETINGS

- AIME: annual meeting, Feb. 18-22, Jefferson Hotel, St. Louis, Mo.
- Canadian Institute of Mining and Metallurgy: annual meeting, Apr. 9-11, Chateau Frontenac, Quebec.
- ASME: spring meeting, Apr. 2-5, Atlanta-Biltmore, Atlanta, Ga.
- American Mining Congress: coal convention and exposition, May 14-17, Public Auditorium, Cleveland.



CHARLES E. WALKER (LEFT) AND HUBERT H. BARBER head a series of operating-department promotions announced last month by the Island Creek Coal Co. and Pond Creek Pocahontas Co. Mr. Walker was named to the newly created position of general manager for Pond Creek Pocahontas and Mr. Barber was appointed general manager of Island Creek, to succeed Mr. Walker.

Personal Notes

T. J. Crocker has been appointed manager of Bethlehem Collieries Corp., succeeding the late K. M. Quickel. Mr. Crocker, a graduate of Pennsylvania State College, has served with Bethlehem Collieries in various capacities since 1923, and as assistant manager since 1942. **L. H. Chalfant,** formerly superintendent of the Ellsworth Division was appointed assistant manager of Bethlehem Collieries last August and is continuing in that capacity.

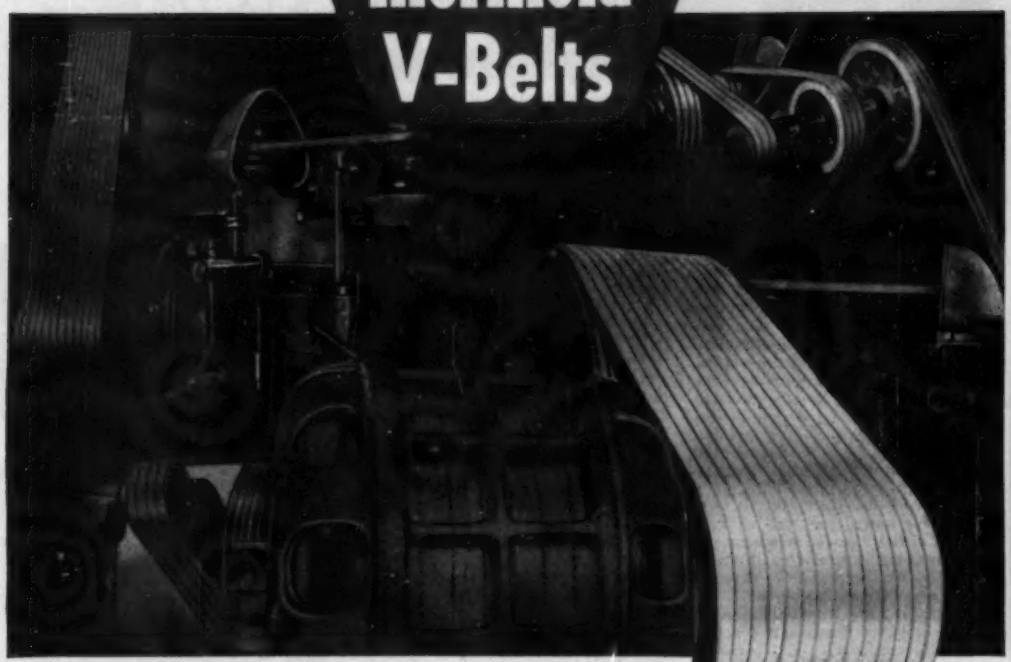
William L. Davis, associated with the Glen Alden Coal Co. for 48 yr, recently retired. For the past 20 yr up to his retirement, he had served as superintendent of the company's South Wilkes-Barre colliery. **Thomas E. Williams,** mine foreman at the property for the last 10 yr, has been named superintendent to succeed Mr. Davis. **Walter G. Young** has been promoted from section foreman to mine foreman, replacing Mr. Williams.

In keeping with the continued growth of its properties and the accompanying organization needs, the Island Creek Coal Co. and Pond Creek Pocahontas Co. have made a series of management promotions in the operating department, effective Dec. 15.

James L. Hamilton, vice president in charge of operations, has announced that **Charles E. Walker,** the present general manager of the Island Creek properties, is being transferred to fill a similar position for Pond Creek Pocahontas. This is a new position being created in view of Pond Creek's expanding Kentucky and West Virginia divisions and the consequent need for increased executive direction. Mr. Walker will headquarter at Paintsville, Kentucky.

Mr. Walker will be replaced at Island Creek as general manager by **Hubert H. Barber,** presently manager

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J. B. Morrow to Receive Erskine Ramsay Medal

J. B. Morrow, chairman of the board, Pittsburgh Coal Co., first vice president, Pittsburgh Consolidation Coal Co., and a director of NCA, BCI, BCR and other coal organizations, will be honored at the annual AIME meeting in February with presentation of the Erskine Ramsay Medal in recognition of his distinguished achievement in the production, beneficiation or utilization of coal. The citation to Mr. Morrow reads:

"As an engineer and scientist, Mr. Morrow has served the coal industry with distinction. As an executive he has invariably presided with tact, judgment and success, often through trying times of major decision. Especially notable have been his contributions to both the theory and practice of coal beneficiation, his personal leadership having been largely responsible for the public esteem of coal preparation. He early recognized the need for coordination between the interests of the producers and consumers of coal, and has written valuable papers on this subject. In his active life he has always found time to devote to young engineers, acting as an inspiration to them, and thereby enriching the industry with young blood."

---

of the Bartley Div. of Pond Creek Pocahontas Co. Mr. Barber's present position will be filled by **Nicholas T. Camicia**, who has been serving as a division superintendent at Island Creek.

Another change at the division manager level calls for the transfer of **William F. Diamond**, presently manager of Marianna Smokeless Coal Co., a subsidiary of Pond Creek Pocahontas, to the Kentucky-Elkhorn Div. of Pond Creek as manager. Mr. Diamond will replace W. A. Haslam, who recently resigned. Mr. Diamond will be succeeded by **David E. Bayer**, who is presently assistant to manager of the Bartley Div. of Pond Creek Pocahontas Company.

The above changes caused a number of shifts within the Island Creek organization. **Ralph A. Thompson** was promoted from superintendent of Mine No. 7 to division superintendent in charge of Mines 1, 22 and 27. **M. A. DePietro Jr.**, assumes responsibility as division superintendent of Mines 7, 16, 20, 28 and 29. **Joseph Skiba** continues as division superintendent at the Rockhouse Div., which includes Mines 24, 25 and 26.

M. R. Barker, superintendent, Island Creek's Mine No. 20, has been named superintendent of Mine No. 7, succeeding Mr. Thompson. **J. A. Sarsfield** formerly assistant superintendent, Mine No. 1, has been advanced to superintendent at No. 20, succeeding Mr. Barker.

George C. Cain has been appointed superintendent, Mine No. 93, Consolidation Coal Co. (W. Va.), Jordan, W. Va., succeeding C. R. Fetty, resigned.

C. L. Mabry has been advanced to safety inspector at the Carswell mine, Eastern Gas & Fuel Associates, Carswell, W. Va.

C. E. Lesher, for the past 27 yr associated with the Pittsburgh Consolidation Coal Co. and its predecessor, Pittsburgh Coal Co., retired Dec. 1. Graduating from the Colorado School of Mines in 1908, Mr. Lesher joined the U. S. Geological Survey where he originated the present national system of reporting the production, distribution, and consumption of coal. During World War I, he was director of statistics for the Fuel Administration and later economist for the NCA.

After 4 yr as editor of *Coal Age*, during which time he also served as chief engineer for the Hammond Coal Commission, Mr. Lesher became assistant to the president of the Pittsburgh Coal Co. in 1924. As executive vice president of the Pittsburgh Coal from 1926 to 1938, he supervised its mining modernization program and introduced coal cleaning and preparation to the Pittsburgh district.

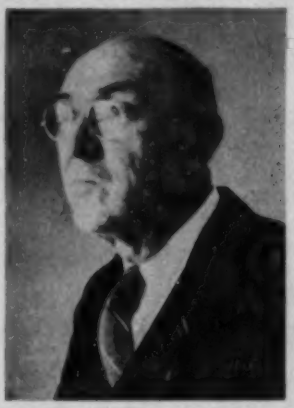
Since 1939, as president of the Pittsburgh Coal Carbonization Co., now the Disco Co., Mr. Lesher developed the Disco continuous process of low-temperature carbonization of coal. Mr. Lesher designed and built the recently completed Disco plant for Pittsburgh Consolidation, where a quarter million tons a year of smokeless solid fuel is now being made. He plans to engage in consulting practice as a specialist in coal processing and the economics of production and utilization of coal and its products.

Obituaries

K. M. Quickel, manager of Bethlehem Collieries, died on Dec. 4 after some months' illness. Mr. Quickel, a graduate of Pennsylvania State College, worked in coal mines in Tennessee, Kentucky and West Virginia before joining Bethlehem Collieries in 1916. He was appointed assistant to the manager in 1934 and manager in 1940.

John M. Jamison, 86, chairman of the board of the Jamison Coal & Coke Co., Greensburg, Pa., died Dec. 16 at his home. Long a prominent figure in the coal industry of Western Pennsylvania, Mr. Jamison was a former state senator. He was graduated from Princeton University in the Class of 1887.

Fred C. Morgan, 67, senior partner of the Morgan Coal Co., Indianapolis, died Dec. 6 in a Hollywood, Calif., hospital while on a combined business and pleasure trip. Mr. Morgan had been active in Indiana and Illinois strip mining for the past 20 yr.



Fred W. Richart, Carterville, Ill., associated for many years with the General Electric Co. and more recently a member of the staff of *Coal Age*, died Dec. 10 at his home.

After earlier retirement from the sales and engineering staff of the General Electric Co., Mr. Richart served *Coal Age* on an assignment basis for several years until he joined the staff Aug. 1, 1941, as a full-time assistant editor. He served in that capacity during the war years until he terminated his regular connection with *Coal Age* at the end of 1945. Since that time he had occasionally contributed articles and other material. During his service with *Coal Age*, Mr. Richart specialized in developments in the coal fields of the Middle West and contributed a number of outstanding special studies of mining problems.

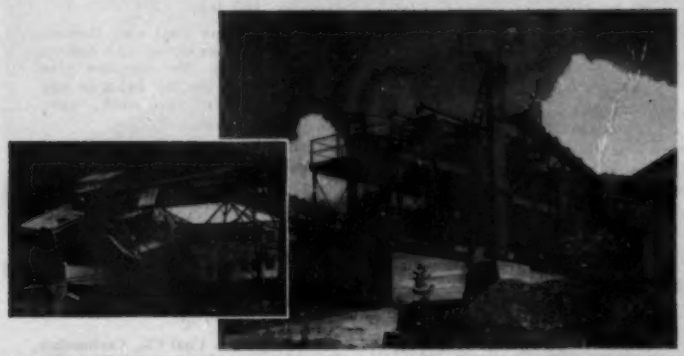
Thomas A. Shewey, 72, active in Mingo County for many years, died Dec. 4 at Kermit, W. Va. Although he had retired 2 yr ago, Mr. Shewey retained interests in the Chafin Branch Coal Co. and T. A. Shewey & Sons. He also was one of the organizers and a former president of the Kermit

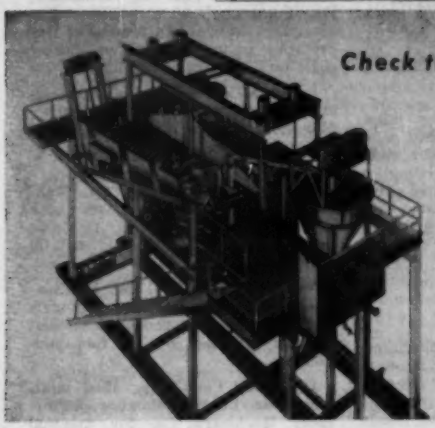
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State Bank. Mr. Shewey first entered coal mining in 1902 when he joined the Mill Creek Coal Co.

E. A. Bowers, 73, general counsel and a director of the West Virginia Coal & Coke Co., died Dec. 1 in Charleston, W. Va., where he was staying overnight en route to Cincinnati on business. An attorney and resident of Elkins, W. Va., for over 50 yr, Mr. Bowers also was general attorney in West Virginia for the Western Maryland R. R.

Lloyd B. Ramsey, 69, identified with the West Virginia coal industry for 32 yr, died Nov. 25 in a Charleston, W. Va., hospital. He had been secretary of the Ridgeview Coal Co., Ridgeview, W. Va., for the last 13 yr.

Lee Barham, 57, co-owner of the Oak Grove Coal Co., Marion, Ill., died Dec. 5 in Holden Hospital, Carbondale, Ill., following an operation performed the week previously.

Sidney B. Purcell, 60, associated for 30 yr with the Clinchfield Coal Corp., Dante, Va., as a mining engineer, died Nov. 22 in Johns Hopkins Hospital, Baltimore.

Preparation Facilities

Glen Alden Coal Co., Baker colliery, Scranton, Pa.—Contract closed with Menzies Separator Co. for manufacture by Glen Alden of three 8-ft Menzies cones; each with a feed capacity of 70 tph, to clean stove, nut and pea, respectively.

Mammoth Coal Co., Raven Run, Pa.—Contract closed with Menzies Separator Co. for one 9-ft Menzies cone to clean No. 4 buckwheat; feed capacity, 110 tph (cone previously installed in Sullivan Trail breaker).

Mammoth Coal Co., Raven Run, Pa.—Contract closed with Menzies Separator Co. for one 9-ft Menzies cone with oil flotation to clean No. 5 buckwheat minus 3/64-in to plus 65-mesh; feed capacity, 30 tph.

No. 9 Coal Co., Pittston, Pa.—Contract closed with Menzies Separator Co. for one 12-ft Menzies cone to clean broken and egg (5½x2½); feed capacity, 200 tph (cone previously installed in Sullivan Trail breaker).

Legal Coal Co., Goodspring, Pa.—Contract closed with Menzies Separator Co. for one 3-ft Menzies cone to clean small No. 3 buckwheat and No. 4 buckwheat; feed capacity, 12 tph.

Linton-Summit Coal Co., Regent mine, Sullivan, Ind.—Contract closed with Templeton-Matthews Corp. for addition to existing plant consisting of six concentrating tables, classifying-dewatering vibrating screens, water-circulation circuits, conveyors, etc., to handle 120 tph of minus ¾-in coal for secondary washing; sizes to be prepared, ¾x10 mesh and 10 mesh x 1 mm.

EQUIPMENT APPROVALS

Eight approvals of permissible equipment were issued by the U. S. Bureau of Mines in November, as follows:

Goodman Mfg. Co.—Mining-and-loading machine; six motors, two 75 hp, three 7½ hp and one 8 hp, 250 v, dc; Approval 7-675; Nov. 6.

Ingersoll-Rand Co.—Type 40, Model 75 air compressor; one motor, 75 hp, 550 v, ac; Approval 2-766A; Nov. 9.

Joy Mfg. Co.—Type WK83-R, Model 130 air compressor; one motor, 30 hp, 250 v, dc; Approval 2-767; Nov. 10.

Joy Mfg. Co.—Electrical drive for Type X707-10, Model 121 fan; one motor, 5 hp, 230 v, dc; Approval 2-768; Nov. 20.

Worthington Pump & Machinery Corp.—Type ETI bank air compressor; one motor, 75 hp, 550 v, ac; Approval 2-769A; Nov. 24.

Jeffrey Mfg. Co.—Shortwall truck; one motor, 10 hp, 250 v, dc; Approval 2-770; Nov. 29.

General Electric Co.—Class LSBE 2C10M storage-battery locomotive; two motors, 60 hp, 115 v, dc; Approval 1542; Nov. 20.

Fulton Mfg. Co.—Types 348 (2-cell) and 349 (3-cell) flashlights; Approval 616; Nov. 9.

Templeton Coal Co., Jonay mine, Sullivan, Ind.—Contract closed with Templeton-Matthews Corp. for addition to existing plant consisting of six concentrating tables, water-circulating circuits, etc., to re-wash 120 tph of minus ¾-in coal by interdicting present fine-coal circuit and returning re-washed coal to existing screening and dewatering facilities; sizes to be made, ¾-in x 10 mesh and 10 mesh x 1 mm.

Saxton Coal Corp., Petersburg, Ind.—Contract closed with Templeton-Matthews Corp. for new cleaning plant to replace existing raw-coal tipple, consisting of conveying, crushing, screening and cleaning facilities to handle 220 tph of r-o-m reduced by crushing to 7x0: cleaning unit to be a Belknap 160 calcium-chloride washer to handle 200 tph of 7x¼; sizes to be made, 7x4, 4x1¼, 1¼x¼ (washed) and ¼x0 carbon (raw); all washed coal above 1¼ may be crushed to screenings; remixing facilities to permit loading any combination of base sizes.

ABC Coal Co., Jasonville, Ind.—Contract closed with Templeton-Matthews Corp. for new tipple consisting of screening, picking, crushing, mixing and loading facilities on two tracks to handle 150 tph r-o-m; sizes to be made, plus 6 in, 6x1½, 1½x¼ and ¼x0; sizes above 1½ may be picked by hand, crushed and re-screened.

Smith Coal Co., Combs, Ky.—Contract closed with Roberts & Schaefer Co. for complete equipment for preparation plant embodying Hydrotator for washing 1x¼-in coal at 100 tph and Super-Airflow coal-cleaning equipment for cleaning ¼x0 at 50 tph.

Bluestone Coal Corp., Bluestone, W. Va.—Contract closed with Roberts & Schaefer Co. for equipment for complete coal-preparation plant including R&S Tandem-Hydro-Separator for cleaning 3x⅜-in raw coal; capacity, 100 tph.

Barnes-Dawson Coal Co., Dawson, W. Va.—Contract closed with Roberts & Schaefer Co. for complete steel Marcus tipple, loading 5x1¼-in egg, 1¼x¾ stoker and ¾x0 slack; capacity 450 tph r-o-m.

Gaston Coal Co., Alpoca, W. Va.—Contract closed with Roberts & Schaefer Co. for R&S Super-Airflow coal-cleaning equipment for ⅜x0-in raw coal; capacity, 45 tph.

M. A. Hanna Co., Glen Burn colliery, Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for one 7-ft-dia Hydrotator to prepare rice coal; feed capacity, 80 tph.

Racket Brook Coal Co., Carbondale, Pa.—Contract closed with Wilmot Engineering Co. for two 2½-ft-dia Hydrotators to prepare rice and barley coal; total feed capacity, 33 tph.

Freeman Coal Mining Co., Farmersville, Ill.—Contract closed with Jeffrey Mfg. Co. (by Roberts & Schaefer Co.) for 8-cell Baum jig; capacity, 530 tph, 6x⅜-in coal.

New Big Creek Mining Co., Manchester, Ky.—Contract closed with Jeffrey Mfg. Co. for No. 200 unit washery; capacity, 150 tph, 4x¼-in coal.

West Kentucky Coal Co., Madisonville, Ky.—Contract closed with Jeffrey Mfg. Co. for 1-compartment diaphragm jig; capacity, 35 tph, middlings.

Clinchfield Coal Corp., Moss mine, Moss, Va.—Contract closed with Fairmont Machinery Co. for fine-coal cleaning plant, treating ¼x0 at the rate of 200 tph on Deister SuperDuty No. 7 tables with centrifugal and thermal drying, representing an addition to the present plant.

Consolidation Coal Co. (W. Va.), Williams mine, Stringer, W. Va.—Contract closed with Fairmont Machinery Co. for complete new plant from extension of present r-o-m slope belt; capacity of 450 tph of 5x0-in coal with cleaning involved for the entire size range; the Chance process to be used for cleaning the 5x3/8 size and Deister SuperDuty No. 7 tables for cleaning the 3/8x0, with centrifugal and thermal drying provided for the 3/8x0.



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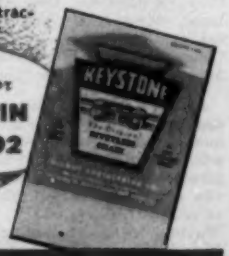
Size	Approx. Pitch	Average Ultimate Strength	Weight Per Ft.
458	4"	48,000	3.5
468	4"	80,000	8.25
678	6"	85,000	6.75
698	6"	140,000	13.0
998	9"	140,000	10.5
9118	9"	230,000	17.0
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Haven Coal & Supply Co., Schuylkill Haven, Pa.—Shipment by Deister Concentrator Co. of one Concenco. Model 105 revolving feed distributor.

Youghiogheny & Ohio Coal Co., Dorothy mine, Rayland, Ohio—Shipment by Deister Concentrator Co. of one Concenco Model 108 revolving feed distributor.

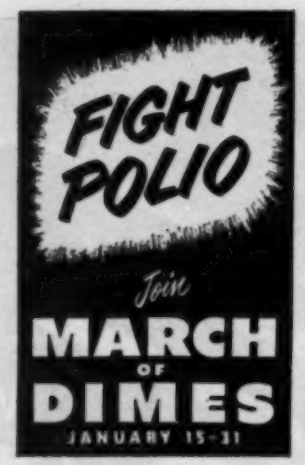
Association Activities

B. B. Housman has been named executive secretary of the Pocahontas Operators' Association, Bluefield, W. Va., succeeding W. E. E. Koepler, whose retirement after 33 yr in that post was announced recently. Mr. Housman has served the association as Mr. Koepler's assistant for more than 30 yr and is widely known throughout the industry. He was one of the originators and has acted as director of the Southern Appalachian Industrial Exhibit held in Bluefield every 2 yr. J. B. Wooldridge Jr., with the organization for the past 4 yr, has been advanced from deputy labor commissioner to labor commissioner, also effective Jan. 1.

AIME has announced the election of new officers, division chairmen and directors for 1951. The electees will take office at the institute's annual meeting in St. Louis Feb. 20. Chairman of the Coal Division is Carroll A. Garner, vice president, Jeddo-Highland Coal Co., Hazleton, Pa. Willis M. Peirce, assistant to the general manager of the technical department of the New Jersey Zinc Co., Palmerton, Pa., is president of the organization for 1951. Among the new directors named to serve 3-yr terms are Charles E. Lawall, assistant vice president, coal properties, Chesapeake & Ohio Ry., Huntington, W. Va.; and Leo F. Reinartz, assistant vice president and manager, Armco Steel Corp., Middletown, Ohio. Richard J. Lund, supervisor, engineering economics, Battelle Memorial Institute, Columbus, Ohio, is chairman of the Mineral Economics Division.

Pennsylvania Bituminous Mine Inspectors Advisory Association, at its annual meeting in Pittsburgh last month, elected the following officers: president, S. E. Conrad, Monongahela; vice president, Clyde H. Maize, Gray; secretary-treasurer, J. V. McKenna, Waynesburg; and recording secretary, W. R. Cunningham, Johnstown. Elected to the board of executive were: A. J. Nairn, Punxsutawney; L. D. Kimmel, Indiana; G. S. Struble, Connellsville; and T. E. Jones, Beaverdale.

Coal Mining Institute of America, at its 64th annual meeting in Pittsburgh, elected G. A. Shoemaker, president; D. J. Keenan, H. P. Greenwald and J. J. Snure, vice presidents.



Newly elected officers of the **Southern Appalachian Coal Operators' Association** are: L. C. Gunter, president; S. G. Moore and D. E. Griffiths, vice presidents, and C. W. Davis, secretary.

Monongahela Valley Coal Mining Institute has elected E. W. St. Clair, general superintendent, Trotter Coal Co., its president for the coming year. Robert G. Seaburn was re-elected secretary-treasurer. Named vice presidents of the group were Ray Brown, George Benson, Frank Brooks Sr., John Gartley and A. E. Spotti.

Thomas Barnes II, president, Bird Coal Co., has been elected president of the **Somerset County Coal Operators' Association,** succeeding Charles A. Merrill, resigned.

New Books for Coal Men

New Market for Coal

Snow Melting, by T. Napier Adlam. A potential market for sizable use of coal is shaping up in snow-melting by means of hot-water coils imbedded in driveways, walkways and roads. Three chapters in this new book describe and illustrate commercial and industrial installations already operating. Other chapters include charts for computing pipe size and spacing, and tables on snowfall data for 270 cities, costs, pump selection and pipe friction. *The Industrial Press, 143 Lafayette St., New York 12, N. Y. 224 pp. 6½x9¼-in; cloth. $4.50.*

What the Future Holds

Energy Uses and Supplies, 1939, 1947 and 1965, by Harold J. Barnett. What happened in energy output and consumption among competing fuels in 1939 and 1947? What may happen by 1965? This USBM publication is a search for ways to answer these questions, together with tentative statistics and projections. For 1965, the author hazards a guess that bituminous production might fall between 523,000,000 and 778,000,000 tons; anthracite, between 37,000,000 and 59,000,000 tons; domestic petroleum, about 2,500,000,000 bbl; natural gas, between 6,518,000,000 and 12,119,000,000 Mcf. Percentagewise, each fuel would share in total energy output as follows: bituminous, 28 to 42%; anthracite, 2 to 4%; domestic petroleum, about 31%; natural gas, 15 to 27%. These wide-ranging estimates grow out of alternate suppositions, as follows: (1) natural-gas commodities and petroleum products may increase greatly while coal supply and manufactured gas decline; or (2) bituminous output may increase substantially while oil and gas increase by smaller percentages. The author invites comment and suggestions on his statistical methods. *U. S. Bureau of Mines, I.C. 7582. 53 pp plus tables. 8x10½-in; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 30, Pa.*

Other Books and Booklets

Coal Resources of Wyoming, by H. L. Berryhill Jr., D. M. Brown, Andrew Brown and D. A. Taylor. U. S. Geological Survey, Washington 25, D. C. Circular 81. Free.

Comparison of BM-AGA and Slot-Oven Experimental Methods of Carbonization, with Results for Eleven Coals, by J. D. Davis, D. A. Reynolds, D. E. Wolfson, C. W. Birge and R. L. Brown. U. S. Bureau of Mines, Bulletin 480. 20c., Supt. of Documents, Government Printing Office, Washington 25, D. C.

Characterization of Tar Acids from Coal-Hydrogenation Oils, by E. O. Woolfolk, C. Columbis, R. A. Friedel, Milton Orchin and H. H. Storch. U. S. Bureau of Mines, Bulletin 487. 35c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

Carbonizing Properties: West Virginia Coals from the Eahle, No. 2 Gas, Pocahontas No. 3 and Pocahontas No. 4 Beds, by J. D. Davis, D. A. Reynolds, W. J. Ode, B. W. Naugle, D. E. Wolfson, R. E. Brewer and G. W. Birge. U. S. Bureau of Mines, Bulletin 493. 30c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

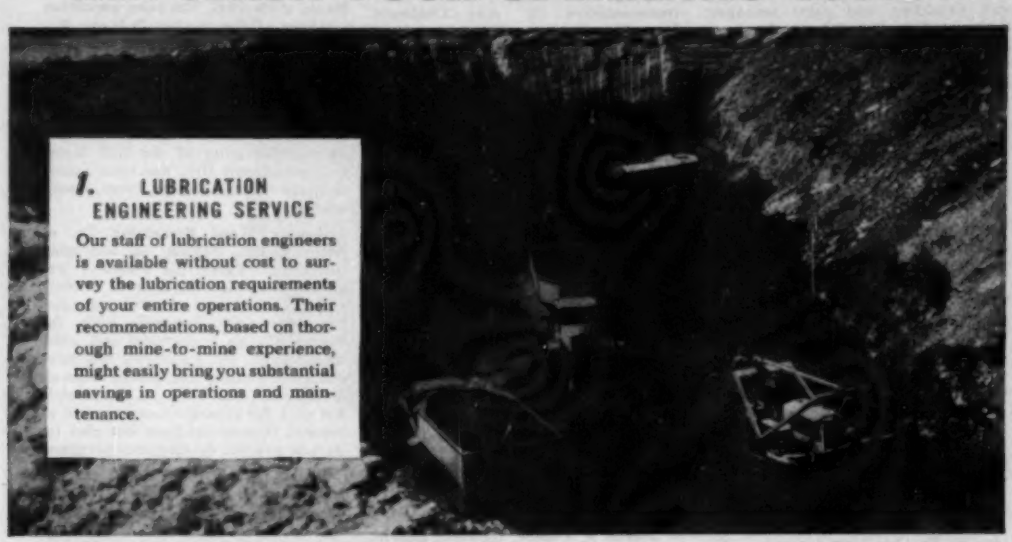
The three following booklets, 6x9-in, recently were published by American Management Association, 330 W. 42nd St., New York 18, N. Y.:

Controlling Indirect Labor and Maintenance Costs, with a Section on Foremen and Worker Morale. Production Series No. 194. 22 pp. 50c.

The Human Relations Job of Personnel Management. Personnel Series No. 132. 40 pp. 75c.

Maintaining Two-Way Communication: Company Experiences and Techniques. Personnel Series No. 134. 42 pp. $1.

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Among the Manufacturers

Morris F. Cunningham, formerly vice president and sales manager, Goodman Mfg. Co., Chicago, has been elected vice president in charge of sales for the company, succeeding the late A. C. Green. William T. Ferguson, former assistant sales manager has been named sales manager, and Cedric E. McWhorter, previously Denver district manager, has been named mining engineer. K. E. Caine will be assistant mining engineer in the Pittsburgh district. Other new Goodman appointments announced include: L. W. Hall, Denver district manager; W. H. Carson, assistant district manager, Huntington, W. Va.; and L. W. Peterson, manager of a branch sales office and supply depot in Birmingham, Ala., which will serve Alabama and western Tennessee and replace Goodman representation by the General Machinery Co., Birmingham. Mike Reid has been appointed sales manager for the company, with headquarters in Bluefield, W. Va., and George Rupp, sales engineer, has been transferred from Middlesboro, Ky., to Beckley, W. Va.

Engineering Products Co., Charleston, W. Va., has been appointed sales representative for the full time of Eriez magnetic separation equipment and plans to make available complete research and laboratory testing facilities through the cooperation of the Eriez organization. George Garrett and Ralph Crump are members of the sales force for Engineering Products Co., and F. E. Anderson is general manager.

Cutler-Hammer, Inc., Milwaukee, has named O. P. Robinson manager of its Pittsburgh district sales office, succeeding T. S. Towle, who is retiring after 36 yr with the company Mr. Towle has served as manager of the Pittsburgh sales district for the past 21 yr. Mr. Robinson joined Cutler-Hammer in 1936 as a member of the Chicago district sales office and was transferred to Pittsburgh in 1940.

J. L. McDermott has been named district sales representative for Marion Power Shovel Co. in eastern Missouri and southwestern Illinois, with headquarters in St. Louis.

Westinghouse Electric Corp. has named Vernon L. Ingersoll supervisor of the newly formed mining, paper and textile section of the Industrial Div. of the eastern district sales organization.

Harry G. Morrow, former welded-products sales manager for Spang-Chalfant Div. of the National Supply Co., has been named vice president, L. B. Foster Co., with headquarters at the company's main offices in Pittsburgh, B. L. Foster, executive vice president, has announced.

George A. Wampler, former sales representative in Allis-Chalmers Memphis district office, has been named manager of the Chicago warehouse sales unit, a new section set up in the company's Chicago district office to handle the sales of small apparatus, including motors, controls, Texrope drives and pumps. The new unit will be located at 500 E. 27th St., Chicago.

Ajax Flexible Coupling Co., Inc., Westfield, N. Y., has elected Wayne Belden executive vice president, Charles Belden, vice president, and Robert G. Cady, sales manager, according to an announcement by William T. Welch, chairman and president.

Walter F. Garlow has been named sales promotion manager, The Howe Scale Co., Rutland, Vt. Before joining Howe Scale, Mr. Garlow was advertising manager of the Hewitt Rubber Div. and the Hewitt Restfoam Div., Hewitt-Robins, Inc., Buffalo, and previously was associated with the Bell Aircraft Corp.

Joseph A. Conlon, formerly district sales manager, Chicago branch, has been appointed manager of allied sales for the mechanical goods division, United States Rubber Co., New York. Edwin D. Meade, formerly manager of Western railway sales, has been named Chicago district sales manager, succeeding Mr. Conlon. In his new position, Mr. Conlon will be responsible for sales and merchandising activities of the following affiliates of the mechanical goods division: Eureka fire hose division, L. H. Gilmer division, and New York Belting & Packing Co.

Joseph F. Eckel, manager of the General Electric River Works at Lynn, Mass., since 1947, has been appointed manager of the company's large Motor and Generator Div. at Schenectady, N. Y. Mr. Eckel succeeds J. M. Crawford, recently transferred to Pittsfield, Mass., as manager of the Transformer and Allied Product Div. Herbert L. Ross, formerly manager of manufacturing of the G-E Meter and Instrument Div., has been named to succeed Mr. Eckel as River Works manager.

Osmose Wood Preserving Co. of America, Inc., Buffalo, has appointed George B. Fahlstrom research and development director, John L. Surdam vice president and general manager, has announced. Formerly with the Borden Co. as a chemical and wood technologist, Mr. Fahlstrom will have charge of a newly augmented research department that will be responsible not only for constant improvement of present Osmose products but also for its new product development program.

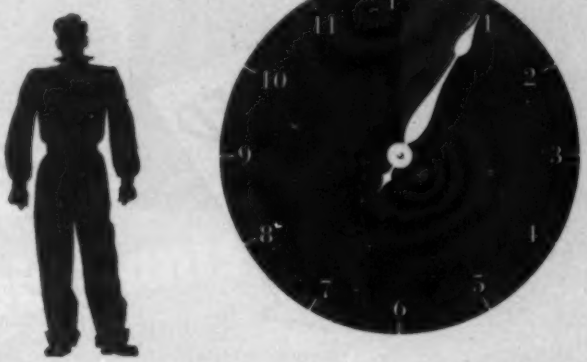
United States Steel Corp. has announced a program, effective Jan. 1, designed to simplify its corporate structure by bringing together into a single operating company four of its wholly-owned subsidiaries, the United States Steel Corp. of Delaware, Carnegie-Illinois Steel Corp., H. C. Frick Coke Co. and United States Coal & Coke Co. The resulting single company also will be a wholly-owned subsidiary of the corporation and will be called United States Steel Co., with headquarters in the new office building now being erected in Pittsburgh. Benjamin F. Fairless, now president of United States Steel Corp. of Delaware, will become president of the single company, also continuing as president of the parent company. Present sales offices of Carnegie-Illinois will be conducted in the name of United States Steel Co. but there will be no change in the present customer relationships of Carnegie-Illinois. The new program does not affect the other subsidiaries of the corporation.

The latest service and maintenance information on International Harvester industrial power products will be brought to the company's district-office and distributor service personnel by two mobile training units that recently started a nation-wide tour. "Our mobile training units will enable us to give our customers greater than ever after-sale satisfaction because of the continuous mechanic training we will conduct through this streamlined service program," reported Fred J. Schreck, IH assistant general supervisor of industrial power service. Each unit consists of an International L-180-series truck with a 32-ft enclosed semi-trailer, especially equipped for both a service and a

COAL AGE was founded in 1911 by the Hill Publishing Co. In 1915 COLLIERY ENGINEER, with which MINES AND MINERALS previously had been consolidated, was absorbed by COAL AGE.

When, in 1917, the Hill Publishing Co. and the McGraw Publishing Co. were consolidated to form the present McGraw-Hill Publishing Co., Inc., COAL AGE became a member of this larger publishing enterprise. On July 1, 1927, the journal was changed from a weekly to a monthly.

During 40 years the editorship has been held successively by Floyd W. Parsons, R. Dawson Hall, C. E. Lesher, John M. Carmody, Sydney A. Hale and Ivan A. Given. The editorial staff of COAL AGE presently consists of: Ivan A. Given, J. H. Edwards, William H. McNeal, W. A. Stanbury Jr. and Harold Davis.



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Quick change-over from one washing gravity to another is an outstanding feature of the Chance "heavy density" Sand Flotation Process. Control valves are handled from operating floor. From this vantage point, one man can observe and meet any condition that may arise. In addition, the Chance Process gives you:

High separating efficiency — greater recovery of salable coal, close to 100%; most complete elimination of refuse. Also, from a single Chance Process unit you can obtain a low ash product, medium ash product, and a reject product.

Dependable performance — steady, uniform, trouble-proof operation. Specific gravity of mixture remains constant; efficiency of separation is unaffected by fluctuating loads or changing qualities of coal.

High degree of flexibility — ability to handle coal at operating gravities from 1.35 to 1.65, with size range as wide as 10" x ⅛" to one washing unit.

Get top-quality coal at a saving, and earn the extra profit the Chance Process will help you gain. Our engineers will be glad to cooperate with you in solving any of your coal-cleaning problems.

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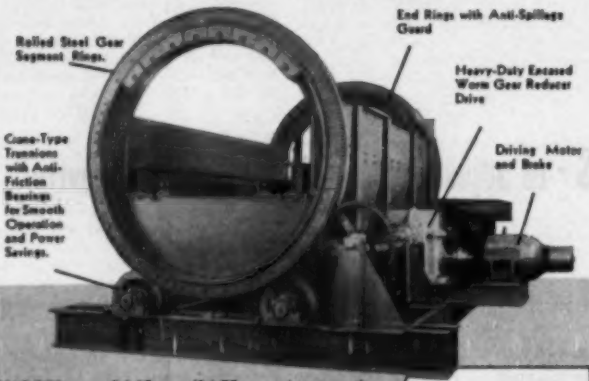
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CONNELLSVILLE (LEPLEY) ROTARY MINE CAR DUMPS

RUGGED FAST SAFE

WITH THESE BUILT-IN FEATURES . . .



RUGGED . . . FAST . . . SAFE . . . these are the qualities built into CONNELLSVILLE (Lepley) Rotary Mine Car Dumps that have enabled them to give the most economical service over long periods of time. CONNELLSVILLE (Lepley) Dumps installed in 1927 and 1929 are still in operation and meeting the demands of modern mechanized coal handling. CONNELLSVILLE (Lepley) Rotary Mine Car Dumps are designed with simplicity and certainty of operation prevailing, with the object of keeping maintenance and repair costs at a minimum. By either lever or pushbutton, one man controls the entire dumping operation . . . Cars are automatically power-locked in position and held secure while discharging . . . Coupled or uncoupled cars are dumped in a 10 second operation . . . Positive gear drive on each end prevents twisting of car in frame.

The proved quality of CONNELLSVILLE (Lepley) Rotary Mine Car Dumps is your assurance of long-term, low-cost operation.

EXCLUSIVE!

EXCLUSIVE with CONNELLSVILLE (Lepley) Rotary Mine Car Dumps are the machine - cut gear rings that mesh with the machine-cut pinions resulting in drive from both ends without play and slippage.

We also manufacture CAGES, HOISTS, HAULAGES, MINE FANS, SKIPS, COAL AND SLATE LARRIES, ROTARY ROCK DUMP CARS, LEPLEY HOISTING EQUIPMENT, YOUGH PUMPS, FORT PITT CAR-CAGING EQUIPMENT.

CONNELLSVILLE MANUFACTURING & MINE SUPPLY CO.

CONNELLSVILLE, PA.

SERVING THE MINING INDUSTRY SINCE 1901

sales-training program. IH distributors are expected to invite interested truck operators and their personnel to attend the training program when presented in their offices.

Allis-Chalmers Mfg. Co. has elected Dr. H. K. Ihrig vice-president in charge of research. Dr. Ihrig, who has served Allis-Chalmers as a consultant for the past 2 yr, formerly was vice president and director of laboratories of the Globe Steel Tubes Co. In announcing the appointment, Walter Geist, A-C president, said, "Allis-Chalmers has vastly increased its research program and its research facilities. We have ventured into such divergent fields as medical research and advanced metallurgy, with particular emphasis in recent months on the beneficiation of low-grade ore or taconite for our ever-expanding demands for steel. The addition of Dr. Ihrig to our staff will permit us to expand and intensify our work in research."

Roots-Connersville Blower Corp., Connersville, Ind., has appointed the Koerner Engineering & Supply Co., Portland, Ore., exclusive sales agents for all R-C products in the states of Oregon and Washington.

Immediate construction of a new manufacturing plant of approximately 272,000 sq ft on a 25-acre plot at Union, N. J., has been announced by John A. Hill, president. Air Reduction Co., Inc., New York. The new plant, which is to be completed early next spring, will employ approximately 800 persons and will be used by the Airco Equipment Mfg. Div. for the manufacture of welding and cutting torches, welding machines and associated equipment.

A $1,000.00 prize competition for technical papers on research and development in the field of 'non-fusion' welding processes has been announced by Eutectic Welding Alloys Corp., New York 13. The competition, which closes May 31, 1951, invites entry of technical papers from both the industrial and educational fields on the following subject: "Technological and Research Aspects, Advances and Advantages of the Use of Lower Melting (lower than parent) Filler Metals in the Non-fusion Welding Processes." Full details of the competition are available from the company.

To provide increased service for its expanding Canadian business, Gardner-Denver Co., Quincy, Ill., is establishing a Canadian plant, company officials announce. The new plant will be located at Brantford, Ont., and will be operated by Gardner-Denver Co. (Canada), Ltd., with production handled through the seven branch offices which Gardner-Denver maintains in Canada.

Fisher Scientific Co. has opened a new service plant at 7722 Woodbury Drive, Washington, D. C., especially



How to cut loading time and repair costs...

SUPERLA Mine Lubricants have reduced loader-clutch repair costs as much as 50% in midwest mines. They have eliminated delays for "warming up" loaders. They have made possible easier and faster loading. Here's why they will assure similar benefits for you:

Superla Mine Lubricants keep transmission cases clean. Clutches operate easily with no gumming or coking caused by oil deposits. When machines are started, these lubricants flow readily between clutch plates, *protect them against wear, eliminate "clutch drag" and the necessity for warming up loaders.* During long periods of continuous operation, Superla Mine Lubricants do not thin out excessively, provide safer lubrication for clutch plates.

A test of Superla Mine Lubricants will prove their ability to keep your loaders on the job longer with less maintenance. These products are available in oil and grease grades suitable for any type of cutter or loader. A Standard Oil Lubrication Engineer will gladly help you select the proper grades for your equipment.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

SIX GRADES FOR LUBRICATING ANY TYPE OF CUTTER OR LOADER

No. 00. An oxidation-inhibited oil containing a detergent additive. It provides exceptionally clean operation and low oil consumption for oil-lubricated gear cases.

No. 0. A high-quality additive-type oil similar to No. 00 but of a slightly heavier grade. It is designed for Goodman loaders and cutters.

No. 2. A soft, semi-fluid grease for lubricating gathering-head gear cases where greater fluidity is desired than that usually provided by most loader greases.

No. 4. A semi-smooth grease particularly resistant to thinning out under heat and mechanical working. At the same time it can easily be poured from the barrel bung at ordinary mine temperatures. It is especially designed for Joy loaders.

No. 6. A grease of heavy consistency and good high-temperature characteristics. Its fibrous structure makes it particularly useful on mine car wheels and for general underground lubrication.

No. 8. A smooth grease having superior high-temperature characteristics. It is suitable for armature bearings and pressure-gun work where a grease of heavy consistency is desired.

STANDARD OIL COMPANY (INDIANA) STANDARD

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CONVERTED GOODMAN 400 LOADING MACHINE

Now! CONVERTED LOADING MACHINES

With ten years of cutting machine conversion experience as a background, the Lee-Norse Company, after exhaustive analysis, has pioneered another development in the modern trend toward trackless mining—TRACK-MOUNTED LOADING MACHINES CONVERTED TO RUBBER TIRE MOUNTINGS !

Save on your present investment and lower your production costs . . . take advantage of the desirable, mobile features of rubber-tired mining equipment . . . CONVERT YOUR LOADING MACHINES NOW !



CONVERTED JEFFREY 29U CUTTING MACHINE



CONVERTED GOODMAN 324 CUTTING MACHINE

CONVERTED CUTTING MACHINES

The Lee-Norse Company specializes in converting track-mounted cutting machines and loaders to rubber tires . . . conversions that can result in modernization and years of additional service to your present track-mounted equipment. Rubber-tired mining equipment permits faster tramming at the working face and minimizes the wear-and-tear on your mine road beds. Profit by the advantages of trackless mining now ! IT'S SMART . . . TO CONVERT !

Our engineers will be pleased to furnish estimates and delivery dates on converting your track-mounted cutting machines and loaders. Write or telephone . . .

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planned to provide large stocks of scientific instruments and apparatus which are essential to defense programs. The new plant contains a full acre of modern shelving and is expected to expedite deliveries along the Atlantic Seaboard from Washington to Key West, Fla., and New Orleans.

Foreign Developments



GREAT BRITAIN — The British government's decision to buy coal abroad, announced Nov. 20, can be regarded as definitely good business, although a political and psychological shock to the nation.

Imports will enable Britain to retain her export coal market and her goodwill in them, which may be badly needed whenever coal again becomes surplus. In that sense the move is a precaution against a future glut rather than against present scarcity.

At most, the coal imports will cost Britain $44,000,000 some of which will be recouped by exports, though not in dollars. The net loss on coal imports will be an insurance premium against a severe winter and failure to expand production. The premium will be wasted if weather and production do improve, but a fire insurance premium is not regarded as a dead loss if the insured premises happen not to burn down.

The present position cannot be regarded as nearly so serious as in 1947, when coal shortage caused ruinous shut-downs of British industry and brought on the dollar crisis of that year. Supplies this year are not nearly so precarious, dollars to buy foreign coal are much more plentiful, and so is fuel oil as a substitute for coal.

With a severe winter, no improvement in productivity and no imports, Britain would probably end the winter with bigger coal stocks than any other country except the United States—but too low to avoid industrial dislocation. With maximum imports Britain's net coal exports in 1950 or 1951 will be far bigger than in 1946 or 1947.

Traders expect imports to be between 2 and 4 million tons, and to be handled by the same private enterprise and coal factors as export British coal.

Imports will have to come from outside Europe. In most European countries supplies are tighter than in Britain.

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upon its quality and fabrication depends the kind of wire rope service you will get.



If this wire goes into a rope of the 6 x 19 Seale Construction with a fiber core, it will be just one of 114. But if it is a "HERCULES" (Red-Strand) Wire Rope, *every* one of the 114 wires will have been rigidly tested to make sure that it met, fully, our exacting standards as to *all* essential properties. Furthermore, the rope will have been designed and fabricated according to the most advanced methods of manufacture.

Only by the strict adherence to such principles can the highest quality in wire rope be produced — *consistently*. It is never a matter of chance.

Because of the exacting care and long experience always used in making "HERCULES" (Red-Strand) Wire Rope, you can depend on it for safe and economical service. As it is made in a wide range of construction — either Preformed or Non-Preformed, there is in this one grade, a "Right Rope" for any heavy duty job.

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McGRAW-HILL MINING CATALOGS

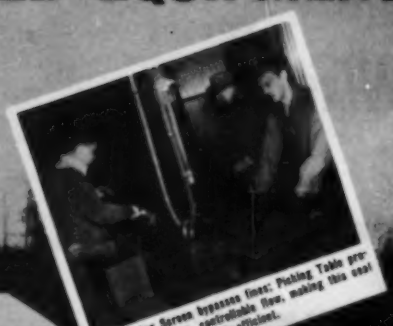
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TIPPLE EQUIPMENT



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First Screen bypasses fines to bin No. 1. Picking Table permits efficient picking, moves coal to second Screen that sizes product for bins No. 2 & 3.



Screen feeds from bin to two Picking Tables that assure a higher efficiency in picking. Belt goes to Sizing Screen located over RR siding.

Syntron Vibrating Screens and Crizzlies, Vibrating Picking Tables, Vibratory Feeders and Electric Vibrators have no motor, gears, eccentrics and other wearing parts that require maintenance and replacement.

Are compact . . . and dual-purpose in design, providing a feeding operation simultaneously with screening, scalping, picking, etc.

Finger-tip control of rate of flow is standard on all models.

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AMSTERDAM—A shortage of anthracite estimated at about 50% threatens Holland with a real problem. The industrial coal situation is becoming particularly serious. The government is trying to increase domestic production and to import from any country at any price.

WESTERN EUROPE — A marked deterioration in the coal supply position of Western European nations was reported early in November by the coal section of the United Nations Economic Commission for Europe. In contrast to an over-all European surplus of 3 million tons of coal and coke during the summer, estimates from the 16 countries participating indicated an over-all deficit during the remainder of 1950 and the first quarter of 1951. In addition to the fact that demand has grown sharply since September, coal production in most European countries has been below target levels in recent months.

The possibility that Western Germany would fill the void seemed questionable when it was reported Nov. 21 that the German government would protest against export of 6,830,000 tons, the quota determined by the International Authority for the Ruhr. The Germans originally had offered 5,100,000 tons, later increasing the figure to 5,800,000. In an effort to boost output and slow the decreasing number of miners working, the German industry put into effect wage increase of 10% for miners in one section and 5% in another. The hikes, effective Nov. 1, were to be followed shortly by a plan for additional incentive payments.

Estimates by the National Coal Association, reported early in December, indicated that the United States would ship Western Europe between 2½ and 3 millions tons of coal up to April 1.

EASTERN EUROPE — A serious production crisis caused by a growing shortage of coal in three "Iron Curtain" countries was reported Nov. 19. While glossed over in recent months, the coal shortage in Czechoslovakia, Hungary and Rumania apparently has become so serious that it can no longer be ignored. Some miners in Czechoslovakia reportedly have been staging a go-slow strike since early fall and in all three countries output was running behind the previously announced goals. The acting general manager of the Czech mines has been suspended by the government, which has ordered an investigation of the industry's failings. In Hungary, a government newspaper called for "more stringent national discipline" and denounced as "really criminal" any slackness in production and administration, while admitting that "in our Hungarian coal mines inexcusable absenteeism is a daily phenomenon."

PARIS—France has concluded contracts with Russia for the import of anthracite, the French state-controlled

Permissibles

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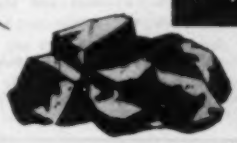
FOR ROCK WORK

COLLIER®C
RED H®B
HERCOGEL®A
HERCOGEL 2



FOR WET WORK

HERCOGEL A
HERCOGEL 2



FOR COARSE COAL

RED H C
RED H D
RED H F
BITUMINITE®D
RED H A
RED H L



FOR FINE COAL

COLLIER C
RED H B



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TIPPLE EQUIPMENT


SHEAVES


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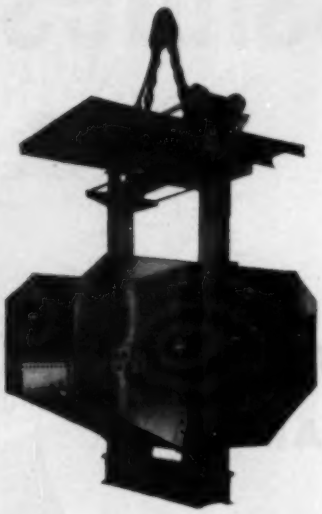

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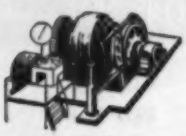
Pre-tested suspension chains with fittings of ample proportions for added protection—Modern improved safety devices reduce danger of serious accidents—Simplified standard Caging and Dumping mechanisms, the results of careful designing—Rugged, well balanced construction, reserve strength built in at critical points, keeping weight at a minimum—Latest design and manufacturing standards plus highest quality material obtainable are used exclusively.

We offer a complete line of Stationary Platform—End Dumping—Side Dumping—Overturning—Man and Material Cages, manufactured from steel or aluminum.

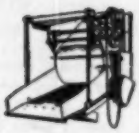
Why not decide on Holmes Cages and benefit from our 50 years experience and leadership in building cages of all types. We'd like to receive your inquiry—our study and recommendations will be made without obligation on your part.

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DANVILLE, ILLINOIS

Association Technique D'Importateurs De Charbon has reported. The first shipment of Russian anthracite, about 9,500 tons, reached France in September and another 12,700 tons arrived in October. One contract provided for the shipment of 25,000 tons of anthracite from the Donetz mines, which supplied fuel for French domestic consumption before the war. A second contract for the supply of 7,000 tons has also been concluded, and further shipments are under consideration.

France has already resumed importing American coal. A contract for immediate importation of 600,000 tons of anthracite and coking fines worth $9,000,000 was reported late in November. The arrangement is being widely criticized in view of probable shut down of marginal coal mines under the Schuman plan.

AUSTRALIA—A 5½-mi cableway estimated to cost $1,400,000 is under construction on the Stockton Plateau, on New Zealand's south island, as a further effort to step up the proportion of strip-mined coal in total coal production. Practically all increase in the dominion's coal production is due to open-cut operations.

Recent investigation of the Stockton deposit has given rise to hopes of recovering 15,000,000 tons of high-grade bituminous coal from a 35-ft seam underneath an overburden of 100 ft. New Zealand geologists consider the quality surprisingly high in view of the coal's shallow depth. Lack of transport has limited production to 1,000 tons a day, which will be boosted to 2,500 tons when the cableway is completed in 1952.

The N.S.W. Mining Co., a subsidiary of the Joint Coal Board, has accepted a tender from George Wimpey & Co., Ltd., of London, for the removal of 2,250,000 tons of open-cut coal from Ben Bullen, near Lithgow. The English contractor hopes to reach a maximum output of 4,000 tpd after the overburden has been stripped with the aid of two walking draglines which the Joint Coal Board recently imported from the United States. About 120 men will be employed at the open-cut.

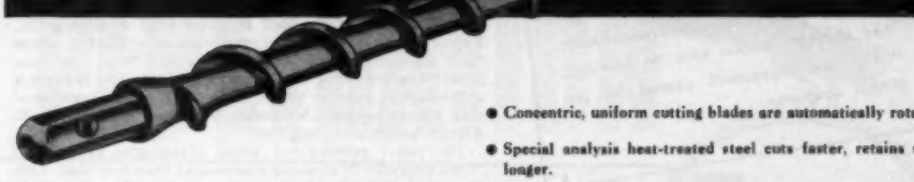
Kentucky Mining Institute Covers Varied Mine Topics

Begins on p 121

mi of roof was so bolted. Attachments on the mining machines step up the speed to 3,600 rpm in the flexible shaft so that its torque will be small and the shaft will remain flexible. Reduction gears in the drill operate the auger at a top speed of 900 rpm. To indicate the speed of drilling in coal, Mr. Crichton said that holes 3 in in diameter and 8 ft deep are drilled in 15 to 25 sec in the Nicholas County mine.

Auger Mining—"Auger mining has





Coalmaster "1046" Drill Bit for 1⅞" Holes . . . Teamed with Spir-L-Weld Auger . . . Gives Longer, Faster, Cleaner Service

- Concentric, uniform cutting blades are automatically rotary ground.
- Special analysis heat-treated steel cuts faster, retains sharp edge longer.
- Advanced two-prong spiral design reduces power consumption.
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- Quick-change bit fits into detachable or weld-on type drill head of Series 0875 "Matched Set" auger.

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- High Tensile Alloy Steel Tubing
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- Uniform Pitch
- Spir-L-Welded to Core
- Maximum Conveyance with Minimum Flight Drag

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- The Buda Co. — Harvey, Ill.
- Diamond Supply Co., Inc. — Evansville, Ind.
- Dooley Brothers — Peoria, Ill.
- Drillmaster Supply Co. — Evansville, Ind.
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- Joy Manufacturing Co. — Main Office, Pittsburgh, Pa. Representatives throughout the world
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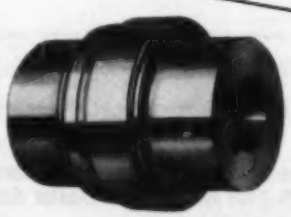
A Couple of Facts about

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Kentucky Mining Institute

been proved an easy and cheap method of mining high-quality coals from seams of varied quality and conditions," said Donald M. Bondurant, assistant professor of mining engineering, West Virginia University. "At abandoned strip pits, coal has been auger mined which possibly might never have been recovered by any other method.

"Auger mining holds tremendous possibilities for underground operations. There seems to be reason to believe that the cost per ton of high-wall-mined coal should be duplicated underground. Entries could be driven by boring four to six holes close together and removing the thin pillars between holes.

"Auger mining works especially well in all types of roof conditions. Only the entries need be timbered. Partings or impure bands in the seam can be left in place.

"Four to five machines can be bought for the price of a continuous mining machine or equipment needed to outfit a working section, providing flexibility of operation and eliminating sharp cuts in daily production should a unit break down. The units are simple in design and construction and easily maintained and repaired. The power demand per unit is not high. Existing substation capacity and transmission lines would not be overtaxed. Either slack or lump coal can be mined at a steady flow that makes it possible to use existing face haulage, such as chain conveyors."

Mr. Bondurant's paper included a chart for quick determination of percentages of recovery for various seam thickness, auger diameter and hole-center spacings. While 78.5% is the theoretical recovery using an auger of seam diameter and leaving no pillar, the operator should strive to get at least 50%. Labor costs of $0.40 to $1.02 per ton and other costs of $1.24 per ton, he said, "substantiate the fact that some operators are mining coal on a contract basis for less than $3 per ton."

Breaking Coal With Air—The fact that Airdox breaking in Oriole Mine of the Bell & Zoller Coal & Mining Co., Hopkins County, Kentucky, produces only 22.26% minus ¼-in slack, compared to an average of 27% at two comparative mines using powder, was given as one important advantage in a paper prepared by A. Ward Padgett, general superintendent, Kentucky Div., and read by H. E. Knight, preparation engineer.

The paper pointed out other advantages as follows: "Less difficulty in cleaning coarse coal than fine coal. Less degradation in the various places along the line from where the coal is shot until it is put in the consumer's bin. No flame or spark is necessary to discharge the Airdox tube. The hazards that accompany handling and storage of explosives are eliminated. The Airdox tube is inactive until com-

(Continued on page 146)

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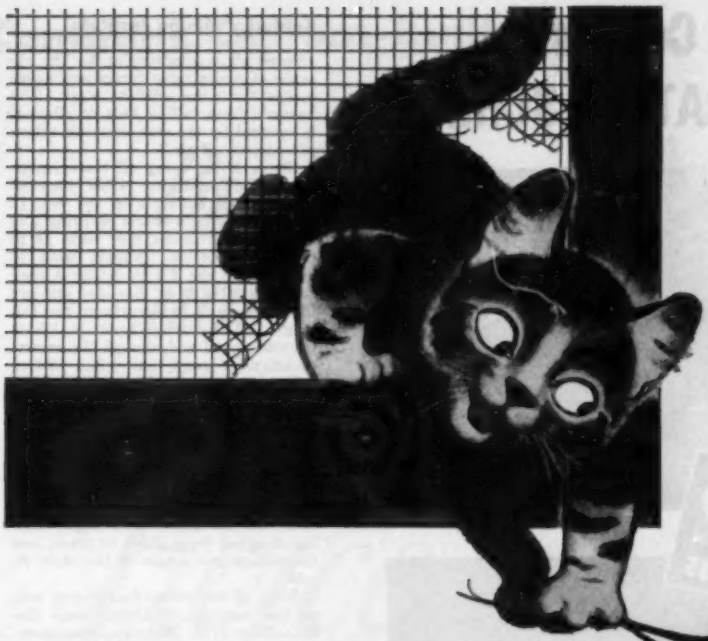
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pressed air is admitted to it. The absence of undesirable fumes and gases makes for more efficient work. The hazards from falling face or rib coal is reduced by the slow heaving action of compressed air."

Oriole Mine, using off-track equipment and producing 4,000 tons of washed coal daily, is in the No. 11 seam averaging 6 ft and carrying 3 in of the characteristic blue band 16 in from the bottom. Augers used in drilling for the 2⅝-in R-325 Airdox tube are 2.187 in in diameter and are in 4-ft sections hard-surfaced the full length. The cutter head is 2⅝-in carbide-tipped and, though the inserts occasionally come out when hitting rock, lower-cost drilling is achieved than with molefoot bits.

Mr. Padgett's paper described in detail the Airdox installation, including the four 10,000-psi compressors installed on the surface, the 1-in OD by ⅝-in ID steel lines carrying the air to within 200 ft of the face, the ⅝-in OD by 0.10-in-wall copper tubing dragged from place to place, and the design and action of the shelf itself.

Some of the safety features as well as the hazards of Airdox were discussed by J. S. Malesky, mining-explosives engineer, U. S. Bureau of Mines, Norton, Va. Another discussor pointed out that 108,000,000 tons of coal have now been mined by Airdox with only two fatalities.

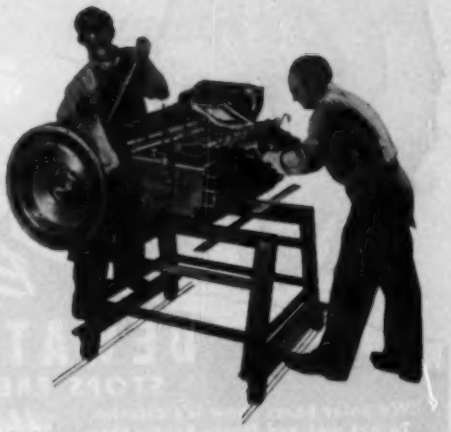
Roof-Bolting Experience — G. O. Tarleton, vice president, Consolidation Coal Co. (Ky.), Div. of the Pittsburgh Consolidation Coal Co., included the bad as well as the good in detailing the roof-bolting experience of his organization, which only a year ago moved from the experimental phase and adopted roof-bolting as a regular procedure. The bolts used are ¾-in with rolled threads and special square heads without camber. They are tightened into expansion shields with a pneumatic wrench at 150 to 200 ft-lb to convert roof strata into a beam. Drilling with 1⅝-in masonry-point tungsten-carbide bits is rotary, with water fed through the hollow drill steels, thus allaying dust and cooling the bits. The drills, hydraulically operated and on booms providing straight-line vertical motion, are mounted on self-propelled rubber-tired trucks.

While the company's experience with roof bolting has been good and is far superior to that with crossbars, failures have amounted to about 0.2% of the top bolted. These are premature failures and do not include expected failures after completion of rooms or removal of pillars.

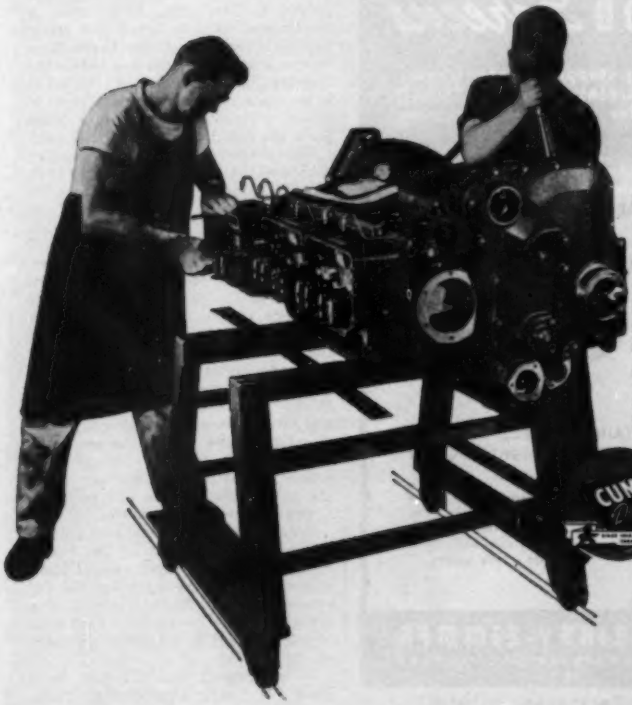
Mining was given up in a limited area where the rider seam dipped to within 2 to 3 ft of the coal, the top losing most of its regular stratified structure and containing slips, angles and swirls. Roof bolts held less than a week. Attempts to hold

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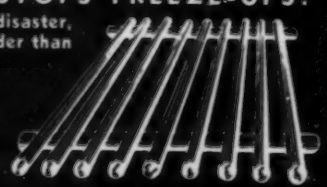
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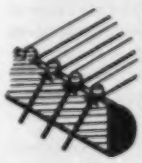


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the top with steel I-beams on close centers, and then with I-beams and bolts, failed. It seems questionable that even longer bolts, angled bolts and bolts with channels would do the trick.

In one section under a creek that was leaking water there were spots of softened slate and poor anchorages that resulted in local falls. Slips in the top along the rib have caused failures in wide-room work. Hot-weather spalling around bolts has caused some failures but this now is minimized in those places by using 2x8x24-in wood cap pieces. The principal difficulties come from "failure to bolt"; that is, man failures in not bolting soon enough and not installing bolts properly.

Mr. Tarleton concluded that "In roof bolting, we have something good but let's not expect miracles from it. Nothing will take the place of good judgment and supervision. The biggest element we have to guard against is the human element, just as with previous methods of timbering with crossbars."

Pinning Top With Wood—Recent experiments in grouting wood pins were included in a paper by Sterling S. Lanier Jr., president, Norton Coal Corp., Nortonville, Ky., dealing with pinning in the company's Rio Verde Mine. The story of wood pinning before the trials with grouting appeared in *Coal Age*, June, 1950. A Continental Gin Co. roof-bolt tester has been received at Rio Verde Mine and on a test, made the day before the meeting, pulls of 17,500 and 18,000 lb were made on grouted wood pins, at which pulls test clamps tore loose from the pins but the anchorage held.

The original experimental section with wood pins installed in July, 1949, is still standing, although areas on each side that were supported by crossbars have failed. Wood-pin reinforcement is now the standard method of roof timbering in the mine. The Norton company makes the pins and, with its present equipment to turn out 100 lin ft of round pins per minute, has tentatively set a price to the commercial market of 1 cent per lin in for limited volume regardless of the diameter of the pin. Mr. Lanier thinks that with an adequate plant and large volume the price can be reduced to save approximately two-thirds of the present cost of steel bolts. Patent applications are pending on various designs and methods.

Engineering Opportunities in Coal—Because eight graduate engineers employed last summer by the Jewell Ridge Coal Corp. have earned their way so well, the company has not yet entered into its fixed program of a definite number of weeks in each type of job, reported L. I. Cothern, director of engineering.

In his paper, "Coal Mining As a Field For Young Engineering Graduates," he maintained that "if we can

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Announces

THREE *NEW* DRILLS



The PARMANCO Coal Drill will drill 2¾ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

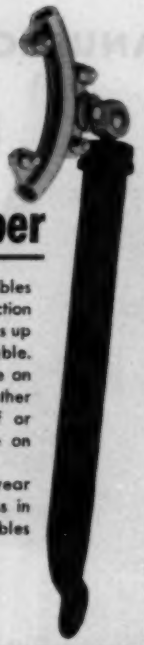
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Kentucky Mining Institute

properly diagnose our mining problems, market problems and personnel problems today, we can probably take care of tomorrow by training young men within our own industry to analyze our problems with a technical, scientific and research type of approach." He summed it up this way: "Men who are made-to-measure should be better than hand-me-downs."

Lower cost per ton using the equipment producing the sizes of coal demanded by the market appears to be the only hope of meeting competition. To cope with the No. 1 problem, delays in mechanical mining, Mr. Cothern contended, requires a "research attitude" on the part of the bosses. They must know practical mining, electricity and mechanics to be able to trace the causes of their numerous breakdowns and operate the equipment within its limitations.

Furthermore, an attitude of cooperation must be developed between operating, maintenance and engineering. Foremen's qualifications based on long experience and examinations not exceedingly different probably will be changed as more young graduate engineers are employed by the coal industry. Mr. Cothern said that time alone is not a measure of ones ability to learn. "Well-equipped examiners and well-conceived examinations can soon determine whether or not an applicant has obtained sufficient knowledge of underground work to be entrusted with the lives of his workers."

Vocational Training — A progress report on the Mayo State Vocational School, Paintsville, was given by James L. Patton, director. In the past 2 yr, about 80 men trained by that school have been placed in the coal industry. Officials of the Princess Elkhorn Coal Co. have reported that they saved $25,000 in training costs by employing seven men trained by Mayo. The school program has molded a more-favorable sentiment for the coal industry.

In addition to the vocational training at Paintsville, a long-range program of High School Extension Shops has been inaugurated. Night extension classes also are being organized and one is now operating at Drift. A committee has compiled the manuscript, data and illustrations for a text book for the mine-training school and its publication is awaiting funds. Progress of the school is indicated by the fact that the appropriation, which stood at $30,000 per year for several years, has been raised to $90,000.

Continuous Mining—BCR's continuous mining machine Test Unit No. 2 will go into a coal mine for operating tests within a few weeks, reported Gerald Von Stroh, director of the Mine Development Program. This machine, 24 in overall and designed to work in coal as low as 28 in., can get 60% or better 2-in lump from a 28-in seam. Diameter of the circles cut by the head in advance of the core-breaker screws



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Made for exclusive use in Cincinnati Duplex Chains. A double ended, reversible, low cost long life bit that's heat treated to specific cutting requirements.



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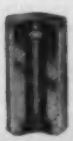
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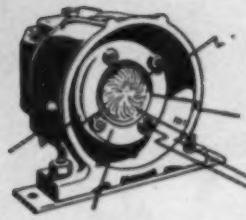
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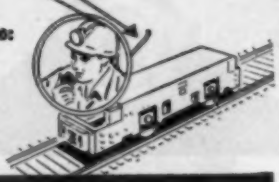


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- at less cost
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The Acker Teredo core drill will tell you quickly, inexpensively, positively the exact condition of coal seams up to depths of 600 ft.

Sturdy enough to withstand the most rugged conditions, yet light enough to be portable, the Teredo can be mounted on truck, trailer, jeep or skid.

In bituminous fields, the Teredo can operate the specially designed double tube core barrel which will retrieve accurate samples, even where others have failed.

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ACKER DRILL COMPANY Inc., Scranton 3, Penna.

can be adjusted by push button without stopping the machine.

The "squirt-rule" shaking-type steel belt conveyor developed by BCR to accomplish continuous face transportation has been shipped to the Consolidation Coal Co. (Ky.) for trials. In consideration for the supervisory force of the mine, visitors will be limited to designated representatives of subscribers to the program. The "pan" weighs but 2 lb per lin ft and, as it is reeled out during mining progress, idlers are placed under it at 10-ft intervals.

Another project is the stainless-steel belt. One is now working on a pitch of 16 deg 4 min. Mr. Von Stroh stated that it is evident that two continuous mining machines should operate on one section. However, this will impose a load of 820 tph on transportation—a requirement few mines can meet. Therein lies another problem. Last year ended the first 2-yr program. That and the program to June, 1952, is costing the subscribers a total of only 4 mills per ton.

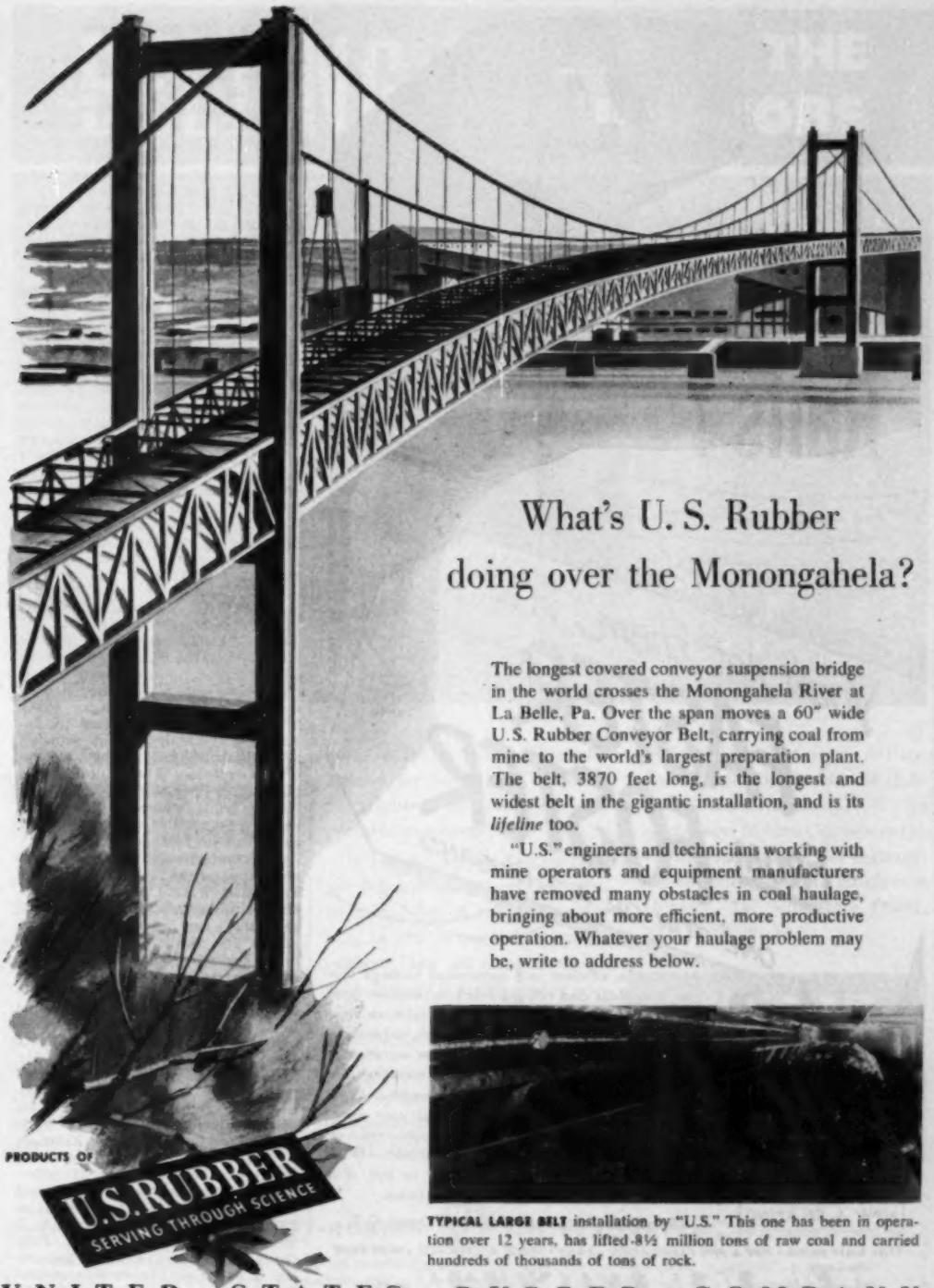
Fighting a Mine Fire—Some new and some unusual practices were employed in fighting a fire and reopening the sealed area in the 2,000 tpd Rosita No. 6 Mine of the Cia. Carbonifera de Sabinas, S.A., Coahuila State, Mexico, which company is a subsidiary of the American Smelting & Refining Co. This job, in a very-gassy mine, was described by Karl Marshall, director of safety. The fire developed on a haulageway as a result of a wreck. Attempts to extinguish it by water pumped to the area through an air line failed. It was then decided to seal and this was facilitated and the risk reduced by introducing 60,000 cu ft of carbon-dioxide over the fire through the air line.

Neutral pressure on the fire zone during sealing and on all seals after completion was developed and maintained by using the two fans and erecting slide regulators. For the 4 mo under seal, all but the heaviest barometric changes were compensated for.

To get rid of the methane upon reopening (75% methane, 0.07% oxygen) it was decided that it would be safer to move it without dilution. Accordingly, a 70-ft stack was erected at the fan house. Moving the concentrated methane required only 4 hr (on a Sunday) and saved a mine shutdown as compared to diluting to 5%. During removal, the residents of a few houses were moved and guards posted.

In the recovery work, extending over a 61-day period and requiring 3,698 hr with oxygen apparatus, a new type of equipment, consisting of oxygen-hood equipped stretchers, was used to bring out at least 20 men who had "passed out" and all of whom revived before they were carried through the air lock.

Synthetic rubber sheeting between layers of boards was used to make



What's U. S. Rubber doing over the Monongahela?

The longest covered conveyor suspension bridge in the world crosses the Monongahela River at La Belle, Pa. Over the span moves a 60" wide U.S. Rubber Conveyor Belt, carrying coal from mine to the world's largest preparation plant. The belt, 3870 feet long, is the longest and widest belt in the gigantic installation, and is its *lifeline* too.

"U.S." engineers and technicians working with mine operators and equipment manufacturers have removed many obstacles in coal haulage, bringing about more efficient, more productive operation. Whatever your haulage problem may be, write to address below.

TYPICAL LARGE BELT installation by "U.S." This one has been in operation over 12 years, has lifted 8½ million tons of raw coal and carried hundreds of thousands of tons of rock.

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Kentucky Mining Institute

airlocks and seals tight. Concerned with the speed with which the fire spread, the company has equipped a truck and trailer with a hoist and a torpedo-shaped cage to be installed quickly in any one of the 10 shafts not already equipped with escape ladders or stairs, thus making every shaft a potential escapeway.

M. C. McCall, engineer in charge, U. S. Bureau of Mines, Birmingham, pointed out that on this Mexican mine job several "firsts" in recovery work were chalked up.

Mr. Lanier, in a discussion from the floor, told how the introduction of carbon-dioxide through a borehole into a sealed fire area on the haulageway of a mine of the Norton Coal Corp. completely displaced the atmosphere and enabled opening the area within a short time so that the mine lost only 2 or 3 days' work. Introduction of the carbon-dioxide through a small pipe inserted in the borehole and terminated within a few inches of the bottom permitted the borehole to be used also as a vent.

Kentucky Fires and Explosions—Reporting on fires and explosions in Kentucky from the time of the meeting Dec. 10, 1949, to the present sessions, A. D. Sisk, chief, Department of Mines & Minerals, said that 17 fires and one explosion had occurred. In view of the fact that at least eight of the fires were from falls of roof pulling down trolley wires or feeders, he cautioned against leaving trolley wires hot when heavy power is not needed. He suggested the installation of circuit breakers, switches at all branches and the maintenance of proper fuses. The explosion took place in a three-man truck mine in Knott County where 32 holes were shot by permissible using fuse. The cause had not been determined.

Eye Protection—In a comprehensive paper on the "Importance of Eye Protection in Coal Mining," Wm. J. Maher, Mine Safety Appliances Co., said that eye injuries represented almost 8% of the disabling injuries in the coal mines in 1948 and that the average frequency rate of disabling eye injuries for mining companies during that year was 4.85, compared to an average of 0.67 for all companies of all industries reporting to the National Safety Council. Mr. Maher's findings and a suggested program for large-scale eye protection will be found in an abstract of his paper beginning on p 77 of this issue.

The Foreman and Labor Relations—"Most of the difficulty arising in the day-to-day administration of collective bargaining contracts can be traced to tactless and thoughtless actions on the part of the foremen," said A. J. Bartlett, personnel director, Pond Creek Pocahontas Coal Co., in presenting a paper on "Labor-Management Relations and the Foreman." Mr. Bartlett's paper, which covers a wide range of facts for both top manage-

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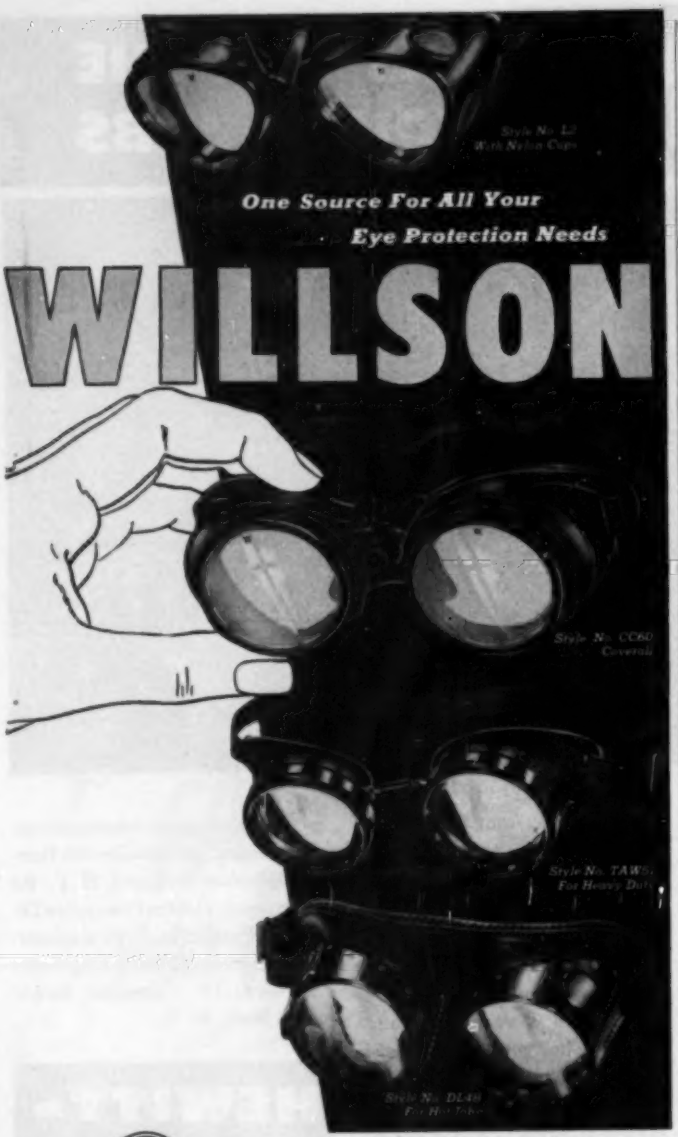
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Kentucky Mining Institute

ment and formen, is digested in this month's Foremen's Forum, beginning on p 98 of this issue.

Loading-Machine Time Study — Loading-machine time studies in Leatherwood (Ky.) No. 1 Mine, Blue Diamond Coal Co., were described by Joseph M. Richards, engineering department. Selection of the type of time studies he explained as follows: "All other operations such as transportation, preparation, maintenance and supplies are supplementary to the loading machine. The report was set up to show how the loader worked and the time it spent at its necessary duties. Those other supplementary operations were geared and coordinated to prepare coal, move the coal, supply the section and maintain the machinery in such a manner as to not interrupt the duties of the loading machine."

In these time studies, necessary operations of the loading machine were divided as follows: loading coal, waiting for shuttle-car change-out, tramming the loader from place to place, interval between production and the man-trip, testing top, and loading out necessary rock, dirt, mud or dust. The classification of unnecessary delays is: unnecessary deadwork, delays to shuttle-car haulage or congestion of machinery or cables, mechanical, preparation, delay in unloading shuttle cars, and delays to mine-car supply.

Mr. Richards exhibited in his paper a typical work sheet and an analysis on one machine. It loaded 39.8% of the time, did other necessary operations 37.8% and was delayed unnecessarily 22.5% of the time.

"Identification of Kentucky Coal Seams" was presented by J. E. Johnston, U. S. Geological Survey, Lexington. He emphasized the economic importance of correctly identifying the coal beds, explained the different methods of identification and illustrated some by slides.

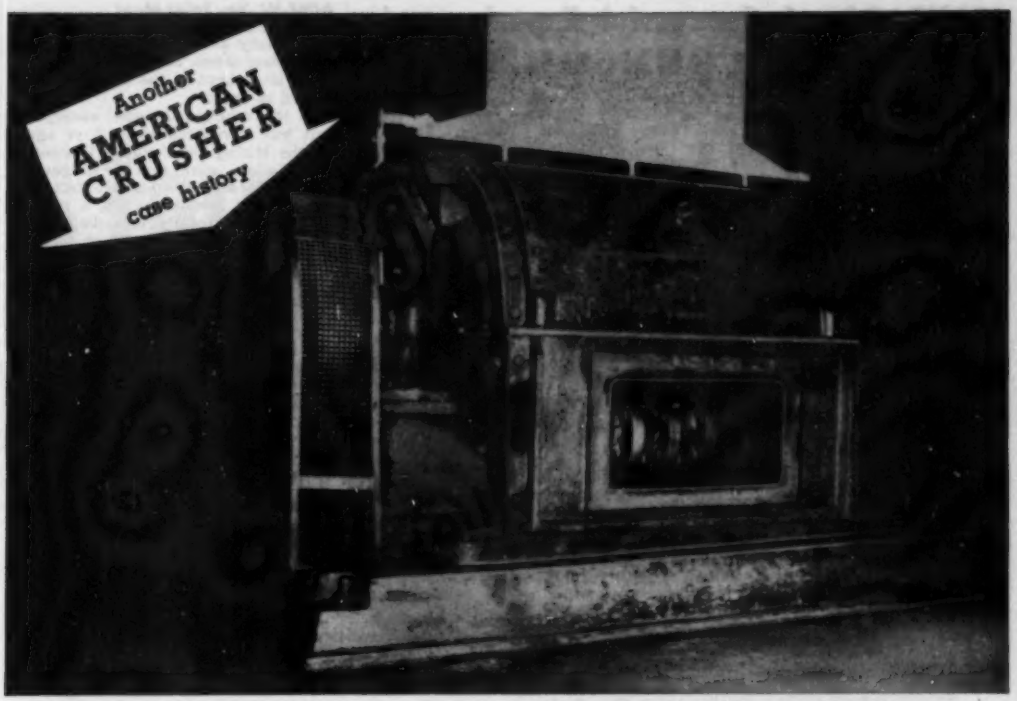
Reporting for the committee on education, V. D. Picklesimer, general superintendent, South-East Coal Co., said the University has changed its curriculum in line with the recommendations and is establishing field classes. These are now being taught in three mining communities, one by Mr. Knight of Bell & Zoller; one by J. K. Berry, Consolidation Coal Co.; and one by J. Peraino, Inland Steel Co.

AIME-W. Va. Groups Hold Joint Meet

Begins on p 122

follows: (1) $2 per lineal foot instead of $6 to $7, (2) slight take-up is required, (3) fewer idlers required and (4) less power required to drive.

England and Europe began using steel belts for power transmission to replace rope drives about the turn of



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AIME-W. Va. Joint Meet

the century and by 1916 were using many steel drives, demonstrating that there is no limit in the belt itself in regard to speed.

In this country, the steel conveyor belt was introduced about 2 yr ago by the Mining Development Committee. Splices were first investigated and, while a completely satisfactory one has not been developed, a splice practical for readily extending and retracting steel belts has been found. A stainless-steel belt is now being tested on a slope of 16 deg 4 min, equal to 28.4%, at a mine of the Jamison Coal & Coke Co., Hostetter, Pa. The belt is sensitive to tracking but is readily guided by side rollers.

Mr. Von Stroh reported that the United Electric Coal Cos. expect to try a stainless-steel belt on a wheel excavator at a strip mine, and also that the Goodman Mfg. Co. is experimenting with steel belts. Because of minimum stretch, conveyors using steel belts need a finer adjustment than conventional conveyors. Idlers should be rubber covered and the present recommendation for minimum pulley diameter is 24 in, although with thinner steel it may be possible to go as low as 12 in.

With steel belting, Mr. Von Stroh continued, the center idler has no function and removing it improves troughing. Rolling mills in this country can make belts up to 48 in in width and in sections 1,500 to 2,000 ft long. The Lorig split pulley designed with a low side at the center, as developed for continuous strip mills, is being tried with stainless-steel conveyor belts, but with indifferent success.

Roof-Bolting Panel—Prior to a panel on roof bolting, S. H. Ash, U. S. Bureau of Mines, substituting for Edward Thomas, presented a new movie showing the most recent roof-bolting practices in this country. He said that when he spent 6 wk in England a year ago he found no roof bolting in coal mines and the same situation was reported by Mr. Thomas who was over there this past summer.

In Europe, although the prevalence of longwall, with which the face constantly is changing and considerable back filling is done, appears to rule out roof bolting, interest in it is widespread, Mr. Ash reported. Some 450 mines in the U. S. are now roof-bolting, 350 of which are large producers, he said. In spite of this improved method of roof support, falls of roof continue to be the greatest single cause of coal-mine fatalities.

Charles E. Lawall, assistant vice president C. & O. Ry., was moderator of the panel, which included: R. G. Lazell, engineer of development and research, Island Creek Coal Co.; Frank Zachar, general superintendent, Christopher Coal Co.; G. R. Spindler, director, School of Mines, West Virginia University; L. D. Siniff, electrical and mechanical engineer, Consolidation

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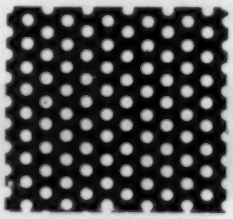
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Coal Co. (Ky.); and W. L. Burrus, general inspector, The New River Co.

Mr. Lazelle said that his company can do little rotary drilling because of sandstone and consequently has completely equipped three mines with stopers. With the two stopers required to keep up the cycle the conventional 120-cfm portable compressor is not large enough or sturdy enough to stand the continuous duty, he reported.

As an alternative, at about one-half the cost of portable units, a central compressor designed for continuous duty is installed on the outside and piped to the seven or eight working sections, with 5-in pipe on the mains, 4-in on the flats, 3-in on the butts and 2-in to the faces. It should be practical to carry the air up to 3 or 4 mi, he said. Wet drilling is used in some places, with dry drilling with dust collectors the company practice in many places.

In mines of the Consolidation Coal Co. (Ky.) with water pipes already available in the sections, water is used on the rotary drills which are mounted on booms of special machines, Mr. Siniff said. Water on the bit keeps it cool and increases life of the bit 20 to 30 times over dry drilling. The men, however, object to water in the low coal.

Mr. Zachar described bolting in the Pittsburgh seam, where two men paid a total of approximately $32 average 100 bolts per shift, which produces 500 tons of coal from a working height of 6½ to 7 ft in an 8-ft seam. Bolts 3 to 6 ft long, with the majority in the longer range, are anchored with expansion shells about 14 in up in the black rock. The washer used is 8x8x⅝-in.

He also told of some failures as a result of the sluffing out of a soft streak of coal 2 ft from the bottom, which thus widened the span until the black rock failed. Also, there have been failures in the Sewickley seam as a result of cutters. It has been found, however, that enough roof bolts in an area usually will divert a cutter into the rib.

Mr. Burrus reported that the New River Co. has ceased roof bolting of the 14-in drawslate at the faces, because the men objected to the use of water drills in low coal, and the company found it practically impossible to practice dry drilling and abide by recommendations of the U. S. Bureau

57 NEW PRODUCTS . . .

OR CATALOGS are described in this month's New Equipment section starting on p 102. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs?





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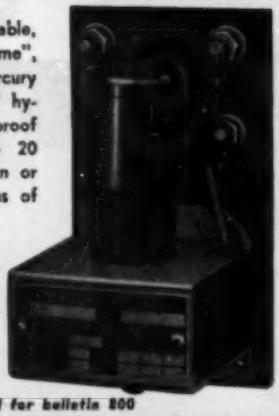
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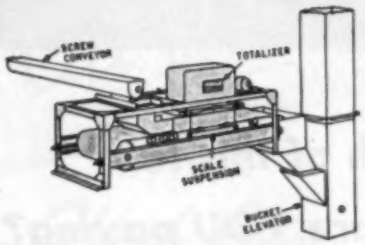
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AIME-W. Va. Joint Meet

of Mines, which was called in by the men and company to settle the question.

In describing research being conducted by the School of Mines, Mr. Spindler said that in laboratory tests the split-wedge type bolt at first showed a considerable advantage in anchoring strength over the expansion types, but now that the latter have been improved the advantage is less.

Tests are now underway to determine how well bolts hold in service, that is, after they have been installed for some time. It has been found that uniform tensions are not being obtained and that they vary as much as two to one. Over-tightening may be using up some of the stress that should be available for loading.

W. J. German, mining consultant, called attention to the fact that the drilling for roof bolting in itself may be helping some roof by releasing gas and water. He cited a case where drilling was done for this purpose alone some years ago reporting that this roof, which normally should have fallen, is still standing.

None of the men on the panel had any direct experience to offer in reply to a question regarding corrosion of bolts. Someone, however, mentioned that serious corrosion of bolts at the Norton Coal Corp., in Western Kentucky, had prompted the company to try wood pins, which had been successful with its conditions (*Coal Age*, June, 1950, p 78).

Illinois Institute Scans Coal-Mining Progress

Begins on p 124

roof bolting, was presented by S. H. Ash, chief of the Bureau's Safety Branch, C. C. Conway, chief engineer, The Consolidated Coal Co., St. Louis, Mo., presiding.

Problems incident to roof bolting are as follows, Mr. Forbes said:

1. Dust control when drilling dry—Several types of dust collectors have been developed. Some of them are effective if properly used and maintained.

2. Type of steel for making bolts—Slotted-end bolts should conform to ASTM Specification A131-49T. Minimum requirements have been set for alloy steels.

3. Corrosion of roof bolts—This problem still is unsolved. In mines with high-acid water, corrosion-resistant metals, coatings or sealing compounds are helpful.

4. Anchorages in various strata—This problem still is not completely solved, though field and laboratory test units operated by the Bureau are studying the problem. New instruments and techniques have been developed for this study.

5. Effect of alternate wetting and drying on roof rocks—Sealing compounds, gunite and plastics, are be-



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RESISTORS

ing studied for controlling moisture.

Warning against the dangers of roof bolting without careful study of local conditions, Mr. Forbes urged that all experimental work be done under close supervision and control.

Roof-bolting experience at No. 40 mine, Peabody Coal Co., was summarized by John Williamson Jr., superintendent. Roof bolting is included in the face cycle, with 5 to 6 bolts per place, he explained. With a 30-in wedge-type bolt, 1¾ to 2½ min per bolt is required. Since 16 to 20 places per day are mined, 80 to 100 bolts per day are installed. Drilling is done without water and dust is collected in a box, which is emptied periodically. After roof bolting was begun in one section, output in that section increased from 125 to 350-400 tpd.

Commenting further on roof bolting, L. W. Kelly, mining engineer, U. S. Bureau of Mines, Vincennes, Ind., reported that in Indiana, Illinois and West Kentucky there now are 51 mines using roof bolts for a total of over 200,000 linear feet of roof. As might be expected with the rapid spread of roof bolting, some failures have been reported. Citing two instances, Mr. Kelly said that one failure was caused by gradual reduction of bolt length and gradual increase of distance between bolts; the other failure, by decreasing the number of bolts in a given area and by delays in bolting after a cut was loaded out.

Continuous mining with the Colmol replaces the four conventional steps of cutting, drilling, shooting and loading, said W. J. Phillips, assistant to the president, Sunnyhill Coal Co., Pittsburgh, Pa. Operating with electric-hydraulic power, the machine advances the face at a rate of 15 to 24 in per minute and trams at speeds up to 25 fpm. The low model, now minetested, makes a cut 9 ft 6 in wide and 32 to 51 in high. The intermediate model, now in production, makes a cut 9 ft 11 in wide and 45½ to 71 in high. The high-seam model, now being engineered, will have a maximum cutting height of 88 in.

Describing mine-development operations with the Colmol in the Upper Freeport seam in Preston County, W. Va., Mr. Phillips said that the offset-cut method of advance was used. That is, the machine drove into the solid face some 20 ft, a distance of nearly 4 ft less than the length of the machine. This protected the operator, working at the rear of the machine, from newly exposed roof. The machine then was backed up about 20 ft and a supplemental or partial cut, widening the entry to the desired width, was made to the left of the original cut. When the partial cut came up even with the original cut, the machine continued its advance, making a full cut for another 20 ft or so. Having moved forward a total of 40 ft, the machine then was backed up 20 ft and a supplemental cut was


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Abdul Aboo, Bedouin Sheik, states "Water is wonderfull It keeps the sheltering palms green, my dates in order, and suits my Camels to a T. After a long hard day on the desert, there's nothing like a tall, cool glass of water, the wetter, the better."



Dan Al Louis, Coal Dealer, disagrees. He says "Water clings to coal, causes it to clog up chutes and often freezes in transit. It's the Public Enemy No. 1 of the coal industry."

MORAL

There's a place for everything — *And* if you don't like Wet Coal, there's a place for the

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in your Coal processing plant

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.

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started on the opposite side. With this progressive offset method, an entry of any desired width greater than the width of the machine can be driven, providing ample room for timbering and accessibility to the front of the machine for bit changing and lubrication.

Intermediate haulage has been a real problem, cutting actual working time of the machine to about one-third of shift time, Mr. Phillips reported. Usual practice was to use one shuttle car as a surge bin and a second shuttle car to run back and forth between the machine and the belt. When distance from machine to belt was over 200 ft, the surge car left the back of the machine and transferred its load en route to the other car. The Sunnyhill and Jeffrey companies now are studying the problem of intermediate haulage, he said.

With a 5-man crew (operator, utility man, two shuttle-car operators and a timberman), output for a 7-hr shift at the Upper-Freeport operation was 225 tons. Daily average has gone as high as 262 tpd in a 38-in seam with a 6-man crew working a 5½-hr shift, Mr. Phillips said.

Safety features of the Colmol include the following, Mr. Phillips pointed out: (1) the operator's station is back 20 ft from the face; (2) the machine is strong enough to take a roof fall without damage; (3) because the coal is broken and not ground off the face and because water sprays are used, dust is kept at a minimum; and (4) structure of the machine provides a wide space between the crawlers and the rib.

Is safety your job? That was the question asked by Earl R. Maize, director, Safety Division, National Coal Association, Washington, D. C. Arguing that coal cannot be mined without miners and that the health and well-being of miners should be the prime consideration of a coal company, he urged operators to re-examine the costs of accidents and to adopt attitudes and habits that will make mining safer. This means acting safety, talking safety and constantly reminding workers of the need for safety and the ways to achieve it. Prevention of injury is especially necessary as the Nation faces increasing military needs and diminishing manpower.

"The industry devotes a good $80,000,000 a year to mining safety, yet the basic problem is one of popular education in safety know-how at the grassroots line, which is in the mine and its environs," Mr. Maize said. It is good, but not enough, to talk safety to workers. The important thing is to get workers to talking about safety. Constant talk about safety, plus the right kind of action and attitudes on the part of supervisors and executives, can make coal mining a safe industry, he concluded.

Electrical sequence control in a

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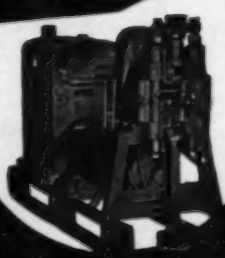


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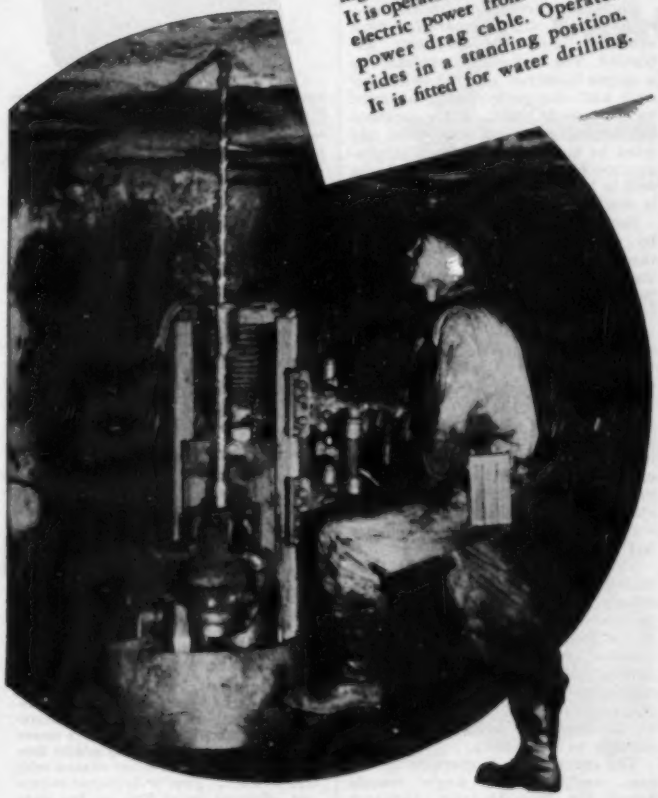
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WHEELBASE – 60 inches

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preparation plant is the interlocking of all units in successive operating order so that each unit can be started only in its order of sequence and only if its preceding unit has been started, said George J. Reynolds, electrical and preparation engineer, Morgan Mines, Inc., Herrin, Ill. Mr. Reynolds was the first speaker at the afternoon session, T. L. Garwood, mechanical engineer, Chicago, Wilmington & Franklin Coal Co., West Frankfort, Ill., presiding.

Defining his terms, Mr. Reynolds pointed out that "interlocking" means that the starting circuit of each unit is so arranged that the unit is locked in a specified starting order with respect to the other units, and that "preceding unit" means the next unit into which the coal is discharged.

There are three control positions—sequence, off and manual—for each conveyor unit, Mr. Reynolds explained. The control is regulated by a simple 3-position selector switch for each unit, the switch being mounted on the console board. In the sequence position, all units are interlocked and must be started and stopped in consecutive order. In the off position, the unit is locked out and the pushbutton is dead.

Sequence of all units is maintained by bypassing the locked-out unit through its selector switch. In the manual position, individual control of the unit is obtained and sequence control is maintained for all the other units. The 3-position selector switch, which has 12 variable cams, makes 12 simultaneous circuits available, though only 7 now are used in the Morgan plant.

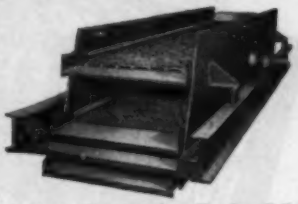
With all units interlocked in successive order, each unit must be started in consecutive order, since each unit obtains its power through the preceding unit. If an attempt is made to start a unit out of sequence, the unit will not start until its preceding unit has started.

This arrangement eliminates lost time caused by flooding or stalling of conveyors if the operator mistakenly pushes the wrong button. Likewise, if the final discharge conveyor stops because of mechanical or electrical failure, all units automatically stop consecutively and almost instantly, thus preventing an overflow of coal at the discharge point and possible damage to other units.

The entire plant is operated by one man working at a single console board, Mr. Reynolds said. Indicator lights on the console tell the whole operating story at once and locate any trouble spot immediately. When trouble appears, the lights for the broken-down unit and all units feeding the broken-down unit go out, showing exactly where the flow has stopped. Meanwhile, all preceding units carry coal away from the damaged unit and thus clear themselves.

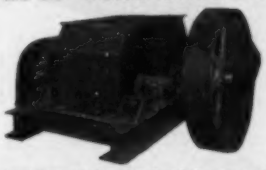
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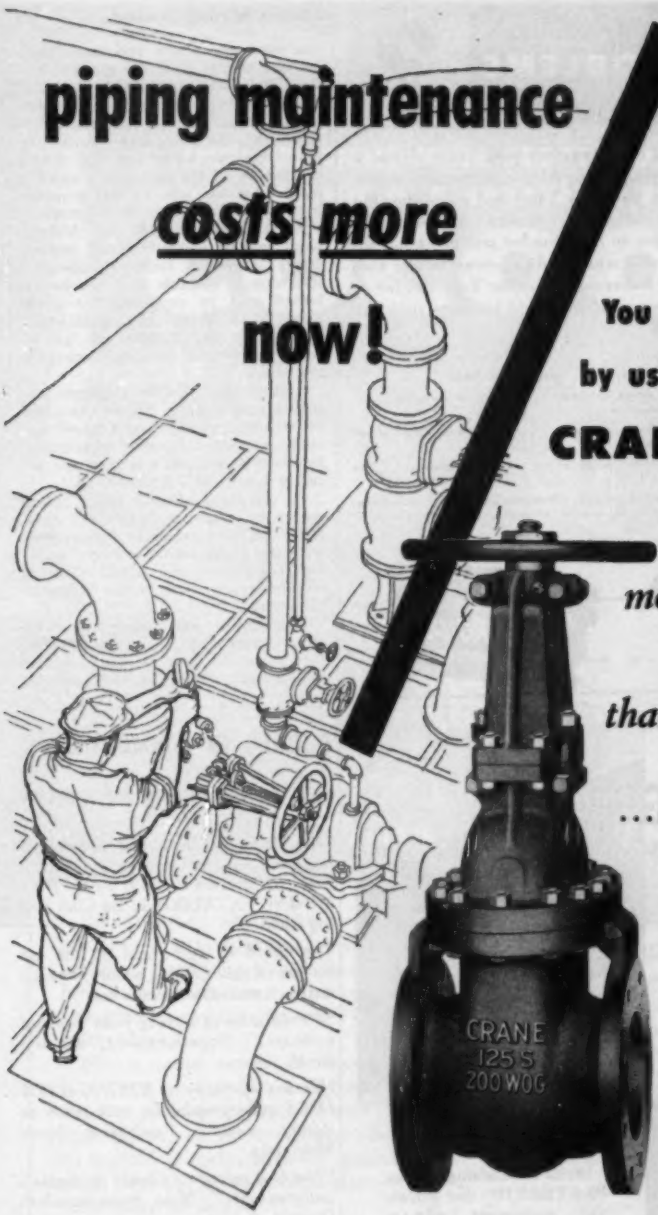
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one man who starts and stops them on horn signal from the plant operator. The boom and plant operators communicate by horn and audiophone. When a change in plant flow is desired, the boom man informs the plant operator as to the coal circuit wanted to fill the car orders and the plant operator sets up the sequence to maintain all units in interlock.

Safety features in the Morgan plant include lockouts at all motors. These individual lockouts supersede the console controls and can be released only by removing the workman's lock from the pushbotton. Emergency stop stations also are located in several strategic spots in the plant.

Cost of materials for sequence control is only slightly higher than that of standard pushbutton control and costs of starter-panel installation, fabrication and maintenance are actually lower, Mr. Reynolds said. In fact, the installation actually makes money by reducing daily down time. After 1½ yr of operating experience with the plant, no unforeseen "bugs" have appeared and plant efficiency has increased many times over, he concluded.

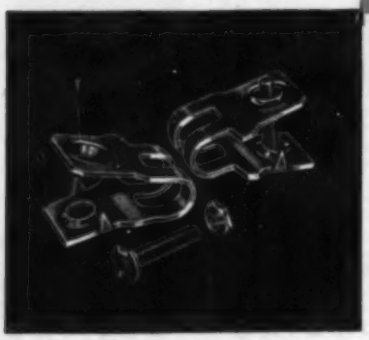
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Illinois Mining Institute

steel that will reduce down time and maintenance, said Charles G. Purnell, Market Development Division, Carnegie-Illinois Steel Corp., Pittsburgh, Pa. Mr. Purnell presented a group of papers on alloy, stainless and low-alloy high-strength steels prepared respectively by R. C. Altman, alloy metallurgist; R. M. Stodgell, product representative, Stainless Division; and C. H. Jackman, senior service metallurgist, Structural, Plate and High-Strength Steels Division, all of the same company. The papers outlined characteristics and usability of the various steels as follows:

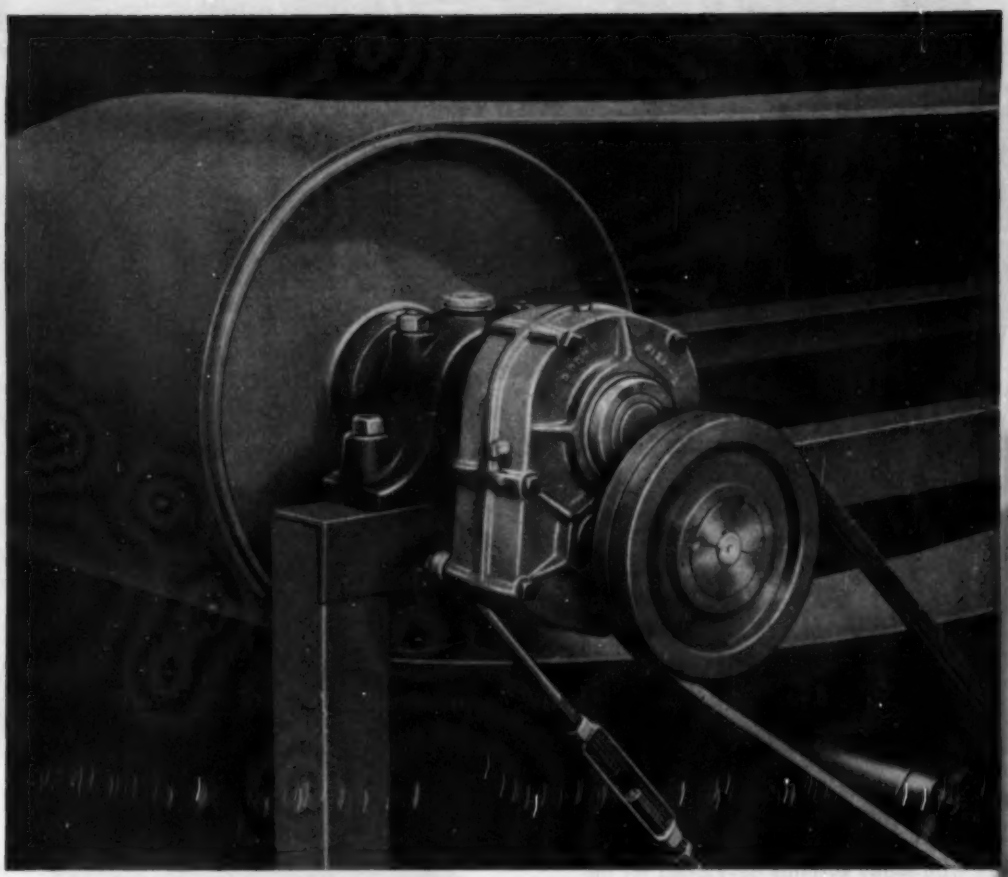
Alloy steels, made of various combinations of molybdenum, nickel, chrome and vanadium, have higher mechanical properties than carbon steels and are especially suited for shafts, pinnings, axles, shovel and dragline buckets and dipper sticks. They are ductile, tough and corrosion-resistant and, though hard, lend themselves well to gas cutting and ordinary machining.

Stainless steel, with high tensile and yield strength, is especially useful in preparation plants for shaker and wire screens, chutes, hoppers and linings. It is corrosion- and abrasion-resistant and, when used for screens, reduces blinding. Specifications for stainless usually are two gages less than for carbon steel. Stainless may be welded satisfactorily but more power is required for shaping and punching it. Experiments thus far indicate that stainless may find wide use in conveyor belts. In a stainless belt, troughing is good, slippage is at a minimum and idlers can be spaced farther apart than with rubber belts. Alignment has presented some problems but they are being solved.

High-strength low-alloy steels include Cor-Ten, Man-Ten, Tri-Ten and A-R. All of these have good mechanical properties, are resistant to atmospheric corrosion and offer weight saving and easy fabrication and riveting. The big advantage of this group of steels is less weight for equal strength or greater strength for equal weight.

Cor-Ten is especially useful in mine cars, chutes, conveyors, screens, hoppers and trucks. Tri-Ten, though less corrosion-resistant, has great weldability and toughness. It is especially useful in light structures that must carry heavy loads, such as dippers, shovels and trucks. Man-Ten, used mostly for heavy structures, provides maximum strength at low cost. It is weldable and corrosion-resistant. A-R, or abrasion-resisting steel, is designed especially for conveyors, chutes and spouts.

Pointing out that economics and suitability should govern a purchaser's selection of steels, Mr. Purnell opened the meeting for questions and discussion in which Messrs. Altman, Stodgell and Jackman took part.



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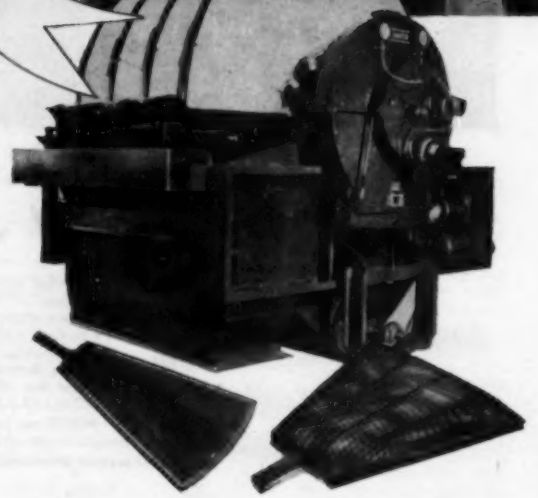
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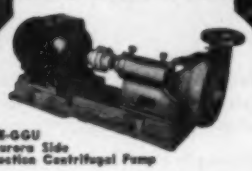
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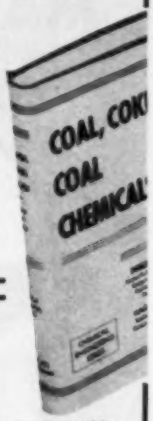
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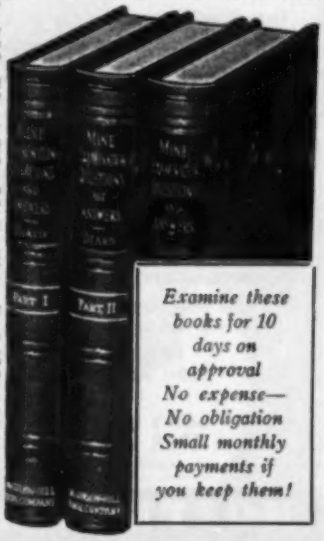
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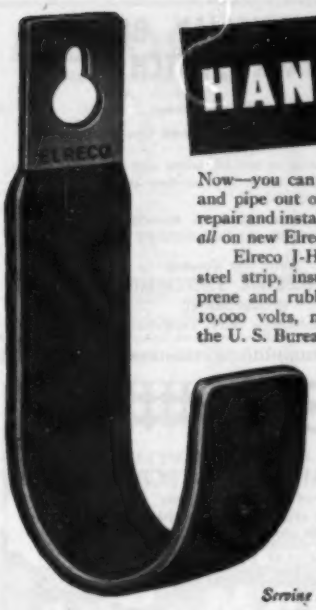
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1	400	G.E.	KT-413	2200	600
1	400	Al. Ch.	AR	440	1750
1	350	Wbsn.	CB	2200	1180
1	300	Al. Ch.	AR	220/440	880
1	125	Al. Ch.	AR	2300	1750
1	125	Wbsn.	CS-761	440	1750
1	125	G.E.	KT-548	2200	875
2	125	C.W.	130Q	440	420
2	100	Wbsn.	CS-663	440	1750
1	100	Al. Ch.	AR-220	2200	1140
5	100	F.M.	HB-281C	440	880
1	100	Al. Ch.	AR	550	880
1	100	F.M.	H-5413	440	450
1	100	Wbsn.	CS-559	2200	1714
1	100	Al. Ch.	AR	440	585

SYNCHRONOUS MOTORS
3-Phase, 60-Cycle

Qu.	HP.	Make	P.F.	Volts	R.P.M.
1	1500	Wbsn.	.8	2200	720
1	700	G.E.	.8	2300	720
1	450	G.E.	.8	440	300
1	400	Wbsn.	.8	440	600
1	350	Al. Ch.	1.	2200	900
2	350	Al. Ch.	.8	2200	514
1	300	Wbsn.	.8	440	900
1	150	G.E.	1.	2200	900
1	150	G.E.	.8	550	450
1	125	G.E.	.8	2200	900
2	125	Al. Ch.	1.	4000/2400	900
1	125	Al. Ch.	.8	2200	360
2	100	Wbsn.	.8	440	1200
1	100	Wbsn.	1.	2200	900
1	100	Ideal	.8	440	900
2	100	G.E.	.8	440	900
1	90	G.E.	.8	440	1200
2	50	G.E.	.8	2300	600

With the above we can supply manual, semi-magnetic or full magnetic, reduced or full voltage control.

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Qu.	HP	Make	Type	Volts	RPM
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1	1000	Wbsn.	CW	2300	514
1**	600	G.E.	MT-413	2300	720
2	500	G.E.	I-16-M	2300	600
1***	450	G.E.	MT-574	2300	600
1**	400	G.E.	I-M	2300	900
1**	400	Al. Ch.	ANT	2300	900
2	400	G.E.	MT-413	2300	600
1	400	G.E.	I-F13-M	2300	1200
1	300	Al. Ch.	ANT	2300	900
1	250	Al. Ch.	ANT	440	440
1	200	Wbsn.	CW-1100	2200	600
1	200	Wbsn.	C.W.	550	514
1	250	G.E.	MT-414	2300	900
1	200	G.E.	I.M.	2300	900
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1	100	Al. Ch.	ANT	440	1140
1	100	F.M.	430-C	440	900
1	75	G.E.	I-M	440	600
1	50	G.E.	MT-530	2300	1150

—Mill type pedestal bearing. *—3-bearing.

TRANSFORMERS (Oil Cooled)

Qu.	K.V.A.	Make	Type	Phase	Voltage
2	4500	G.E.	HT	3	27000/13500/2300
3	4000	G.E.	H	3	22000/12000/4000Y
1	2750	Wbsn.	S	3	67000/14400/7400
5	500	G.E.	IT	3	14400/12300/480
3	500	G.E.	H	1	12300/11550/220/440
3	500	Pitts	OI9O	1	14400/12000/220/440
10	100	G.E.	IT	1	14400/12870/240/480
2	100	Wbsn.	AUTO	1	2400/4100Y/1385/2400Y
2	100	Wbsn.	60	1	13875/10955/230/460
2	75	G.E.	KF	1	2400/4100Y/120/240

MOTOR GENERATOR SETS

Qu.	KW	Make	R.P.M.	Volts DC	Volts AC
1	750	Wbsn.	900	600	2300
1	700 (3U)	G.E.	720	250	2300
1	600	G.E.	720	300	2300
1	500	Al.	720	525	2300
1	500 (3U)	Wbsn.	1200	120/240	4000/2300
1	200	Wbsn.	900	250	2300
1	200	Ridgeway	900	275	2300
1	165	G.E.	720	250	2300/440
1	150	Al. Ch.	1200	250	2300/440
1	150	Ridgeway	1200	275	4000/2300
1	85	C.W.	1200	250	2300/440
1	75	Wbsn.	900	75	2300
1	75	Al. Ch.	900	250	2300
1	75	Ideal	1200	250	440/220
2	35	Wbsn.	1200	120/240	440/220

3U—3 unit set.

DIRECT CURRENT MOTORS

Qu.	HP	Make	Type	RPM
4	222	Wbsn.	Mill (Rev)	600
1	400	Al. Ch.	Mill	600/1200
1	250	G.E.	C D 389	1150
1	225	Wbsn.	Q M	450/900
1	200/250	El. Dy.	2281	600/1200
1	200	Wbsn.	Mill (Rev)	600/1200
1	150	G.E.	M P C	600
1	150	Al. Ch.	Mill (Rev)	600/1200
3	x 150	Cr. Wh.	43 H	600
1	xxx 150	Wbsn.	HEC-190	600
1	100/125	Ideal	1695 F	600/1200
2	100	Ideal	1950 F	600/1200
1	90/100	G.E.	MPL	600/1150
1	80/90	Ideal	1905 F	600/1200
1	x 80/75	Wbsn.	SK 151 L	600/1200
1	80	Wbsn.	SK	600/1200
1	60	Al. Ch.	B 127	600/1200
1	50	G.E.	CD 135	600/1200
1	35	G.E.	CD 147	600/1200
3	25	G.E.	EP 14	600/1200
1	25	Ideal	F	600/1200
1	25½	Wbsn.	SK 150	600/1200
1	20	Al. Ch.	B 145	600/1200
1	20	G.E.	CDM 105	575/1150
2	17½	El. Dy.	13 S	600/1200
2	15	G.E.	EP 13	600/1200
2	15	G.E.	CD 120	600/1200
1	15	G.E.	EP 13	600/1200
1	15	Wbsn.	SK 151 L	600/1200

Above are all 230 V LC except where marked xxx.
xxx—Pedestal Bearing 525/600 V DC Mill design.
Rev.—(designed for mill reversing service).
3—T.E.F.C.

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READY TO GO INTO SERVICE

3—112 A.A. Goodman Universal D.C.
4—112 U.G.3A. Goodman Universal 220 Volts A.C.
3—117 E.3 Goodman Universal 220 Volts A.C.
4—50 H.P. Goodman Standards 220 V. A.C.
3—Goodman Track Cutting Machines 42 Inch Gauge A.C. 220 Volts.
3—Goodman Loading Machines 42 in. Gauge type 3SSD A.C. 220 Volts.
4—350 Jeffries Machines 220 Volts D.C.
1—35BB Jeffries Machines 220 Volts A.C.
6—CE Sullivan Machines A.C. and D.C.
3—7B Sullivan Machines 220 Volts D.C.
1—100 K.W. G.E. M.G. Set 1200 r.p.m. can be seen in operation.
1—Electric Hoist complete with 100 H.P. G.E. Motor.

LOCOMOTIVES

6—6 Ton G.E. Ball Bearing 42 Inch Gauge.
3—Goodman Caterpillar Trucks 220 Volts A.C.
4—6 BU Jay 36 and 42 Inch Gauge on Cats. A.C. and D.C.
4—6 BU Jays 42 Inch Gauge on Cats A.C. and D.C.
3—2 Ton Nuvo Six Ton Keni-Mobiles Model K.M.C 482.

THOMAS GILLESPIE

State Road 67 — Bicknell, Ind.

MOTOR GENERATORS

1—500 KW G.E. Syn. 275 V. 900 RPM 3 Ph., 60 Cy., 440/2300/4000 V. AC.
2—300 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/400 V. AC.
1—300 KW G.E. Syn. 575 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
1—240 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
2—200 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
1—100 KW G.E. Ind. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/400 V. AC.

ROTARY CONVERTERS

1—300 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers
1—150 KW G.E. Syn. 275 V. 1200 RPM HCC, 6 Ph., 60 Cy. Transformers

ARMATURES

1—500 KW G.E. 275 MFC Generator 900 RPM
1—300 KW G.E. 575 V. HCC Converter 1200 RPM

LOCOMOTIVES

2—30 T JEFFREY 250 V. MH-77 48-36" Ga.
3—30 T JEFFREY 250 V. MH-77 48-36" Ga.
2—13 T JEFFREY 250 V. MH-2110 42-32" Ga.
1—13 T GOODMAN 250 V. 136-B 48-36" Ga.
1—10 T JEFFREY 250 V. MH-110 44-32" Ga.
1—10 T G.E. 250 V. HM-629-A 48-36" Ga.
2—10 T GOODMAN 250 V. 36-B 48-36" Ga.
1—8 T WEST. 250 V. ML-906-C 44-36" Ga.

LOCOMOTIVE MOTORS

2—JEFFREY 250 V. MH-77, Ball Bearing
2—WEST. 250 V. ML-908-C, Ball Bearing
1—WEST. 250 V. ML-907-C, Ball Bearing
2—WEST. 250 V. ML-904-C, Ball Bearing
1—WEST. 500 V. ML-907-C, Ball Bearing
2—WEST. 250 V. ML-904-R, B. B. (New)
1—WEST. 250 V. ML-901-C, Ball Bearing
2—G.E. 500/250 V. HM-624-A Ball Bearing
2—G.E. 85/125 V. HM-628-A, Ball Bearing

LOCOMOTIVE ARMATURES

MH-78-500 V. MH-77-250 V. 908-C-500 V.
907-C-250 V. 904-C-250 V. 903-C-250 V.
901-C-250 V. 150-C-250 V. 34-B-250 V.
HM-624-A 500/250 V.

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FOR SALE

25 ton American Gas Locomotive Crane
40 ton Orton Diesel Locomotive Crane
30 ton Davenport Diesel Locomotive
50 ton Whitcomb Diesel Elec. Loco.
2½ yd. Bucyrus 54B shovel dragline
2 yd. Lorain diesel crane dragline, 100 ft. boom. Built 1948
20 yd. Koppel air dump cars. Std. ga.
1300 ft I-R 2 stage elec. air compressors
150 HP Kewanee portable boilers

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2—Ironton Locos, 6000# Chassis, 36" ga., complete with Exide Batteries and Chargers.

PIT CARS

180—Card RB Pit Cars, 36" ga., 1.7 ton cap.
16—Card RB Pit Cars, 36" ga., 1 ton cap.

HOISTS

1—3-Drum I.R. Slusher, with built-in 50 HP AC Motor.
1—#21½ Vulcan Single Drum, direct geared to a U-6 International Gas. Power Unit.
1—#6½ Vulcan, single drum.
1—Box Iron Wks. Single Drum, direct geared to a 15 HP Slip-ring Motor.
1—H&B Single Drum Converted, direct geared to a 25 HP Slip-ring Motor.
1—Crow Converted Single Drum Friction, direct geared to a 7½ HP Slip-ring Motor.

DIESEL GENERATORS

1—D-4400 Caterpillar V-belted to a 30 KVA 220 volt Fairbanks-Morse AC Generator, complete with switchboard.

COAL CRUSHERS

1—24x24 Jeffrey Single Roll, with or without motor.
1—36" American Ring Type Crusher.

MISCELLANEOUS

25—Tons 85# Relaying Rail.
50—Tons 60# Relaying Rail.
Air Receivers—Air Compressors.
Electric Wiring—Safety Switches.
AC Coal Drills.
Belt and Flight Conveyors—Magnetic Pulleys.
Motors AC and DC.
Cent., Piston & Triplex Pumps.
1—4'x8' Hum-mer Vib. Screen.
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1—CE-7 Sullivan AC Coal Cutter.
4—250 volt DC Trolley Larry Cars.
Drill Presses—Band Saw.
1—Card Rocker Dump Car, 90 cu. ft. cap., 36" ga.

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3—14 BU Jey, either high or low pedestal.
1—6 BU, practically new.

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1—800 KW Westinghouse MI Set, 275 V. DC., 1200 RPM. 3/60/2300/4000 V. AC.
1—150 KW Westinghouse Rotary Converter with transformer.

Electric Locomotives

1—6 ton Jeffrey with MH 162 motors.
1—6 ton Jeffrey with MH 160 motors.
1—6 ton G. E. HM 520 motors.
3—10 ton G. E. HM 500 motors.

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1—26" Jay 2500' between center.
1—26" Goodman, 87C, 1200 ft. between center.

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3—35BB Shortwall.
3—30U Top, etc.
2—7AU Top, etc.

Crushers

1—24"x28" Jeffrey Flexisteel Coal Crusher. Uniform size coal.

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4500 Manitowoc with 120' boom, 5 yd. bucket. Twin GMC Diesel Engines. Completely overhauled July, 1950. Near Hazleton.

3500 Manitowoc equipped with an 80' boom, 2½ yd. bucket, Caterpillar D-17000 engine. 1947 machine, used very little. Excellent condition. Near Hazleton.

48-B Bucyrus-Erie Dragline, equipped with 80' boom and Buda-Lanova diesel engine. Used very little. Excellent condition. Located in Hazleton.

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1—20,000 # Allis-Chalmers, Dbl Drum
1—26,000 # Nordberg Sgl Drum
1—10,000 # Nordberg Sgl Drum AC
1—26,000 # Vulcan Sgl. Drum AC with MG Set Complete
1—11,000 # Wellman, Sgl Drum AC
1—16,000 # Allis-Chalmers Sgl Drum
1—30,000 # Allis-Chalmers Dbl Drum AC
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CARPULLERS AND LOADERS

1—5000 # Jeffrey Carspotter AC
1—6000 # Brownie Carspotter AC
1—8000 # Link-Belt Carspotter AC
1—30,000 # Amer. Hoist Carspotter AC

CRUSHERS & MISC.

1—30x30 Link-Belt Dbl Roll
1—36x36 Jeffrey Sgl Roll
1—12x16 Eagle Dbl Roll
1—18x30 Eagle Dbl Roll
1—3 yd. Sauerman Scraper Bucket System

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LOCOMOTIVES

1½ to 10 Ton 12" to 54" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

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Shaker & Vibrating Screens
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300 KW, 275 volts DC, Westinghouse (with AC-DC Swbds and Transformers for 2300/4000Y or 6900/11950Y volts)
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200 KW, 275 volts, DC, Allis-Chalmers
Overhauled and ready for shipment
New AC motors in stock

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1—30x24 McNally Pittsburgh single roll crusher.
1—24x48 McNally Pittsburgh double roll crusher.
1—36x36 Link Belt double roller crusher.
1—18x18 Jeffrey single roll crusher.
1—30x36 United Iron Works single roll crusher.
1—24x24 Jeffrey single roll crusher.
1—24x24 Hercules single roll crusher.

HOISTS

1—Ottumwa Iron Works conical drum hoist, serial #3168, weight 25,000#, 1¼" rope, complete with remote control and hydraulic brake. Direct connected to GE 300 HP motor, model #C2647, type ITC-5017, form M 2/60/2200V, 576 RPM, 71½ amps. 270 secondary amps, complete with automatic switchboard.

1—Ottumwa Iron Works, single rigid cylindro-conical drum hoist, serial #4680, weight 43,000 lbs. 1¼" rope, complete with remote control and hydraulic brakes direct connected to Western Electric 150 HP. motor, model 17815, type MF-304-10-150-720, form B, 3 phase, 60 cycle, 440 volts, slip ring, secondary volts 388, amps. 187, secondary amps. 182, speed full load 700, serial #4562315, continuous 40° C. Complete controller and resistance.

1—Ottumwa Hoist #2961, drum diameter 68", face 36", face grooved for 1" rope, equipped with post brake 54" diameter, hand operated, single reduction cut spur gears, 10 teeth and 196 teeth, 1¼" pitch, 16" face, drum shaft 7" diameter, drum shaft bearing 7"x14", pinion shaft bearing 4½"x18" of the ring oiling type.

2—Now Joy, type CHD, 10 HP. car pullers, complete with Joy HP ¾ HP. DC. rope pullers.

LOCOMOTIVES

3—6 ton Goodman ball-bearing locomotives, 24" gauge, type 2304T.

1—6 ton Goodman ball bearing locomotive, 42" gauge, type 12-AO-47.

1—4 ton Westinghouse locomotive, 30" gauge, Class 4-3-85-C-437.

1—6 ton Jeffrey locomotive, 42" gauge.

8—6 ton GE ball bearing locomotives, 42" gauge, class EMITRAM11 with HM21-A motors.

1—4 ton Whitcomb Battery locomotive, 36" gauge.

2—4 ton Goodman ballbearing locomotives, 36" gauge, type 42-1-4-T. (with or without gathering reels).

1—20 ton Goodman ball bearing locomotive, 42" gauge, type 20AO47.

MINING MACHINES

1—112AA Goodman DC Universal mining machine, 36" gauge, 6½ ft. cutter bar.

2—CLEI, AC, 3 phase, 60 cycle, 220 volt, Sullivan longwall mining machines.

1—Sullivan Shearing Machine, Class CH11, DC, 9' cutter bar.

2—Sullivan Longwall Mining Machines, type CH5, 1/60/220 volts, 30" cutter bars.

3—12AA Goodman standard mining machines, 50 HP, 3/60/220 volts, 8' cutter bars.

MOTOR GENERATOR SETS

1—200 KW Synchronous Ridgeway Motor Generator Set, 1200 rpm. 250 volts, DC, 2200 volts, AC, complete with switchboard.

1—60 KW GE motor generator set type CD 123, form A, comp. wound, 327 amps, 230 volts no load, 275 volts full load, 1200 RPM, cont. 60 deg. cont., #1582066 direct connected to 135 HP GE syn. motor type TB, form PE, frame 7568, 3/60/2300 volts, 1200 RPM, 37.6 amps. cont. 40 deg. cont. Excitation 250 volts, 5.5 amps. .74 PF, #4314071, complete with switchboard.

TRANSFORMERS

3—300 KVA Moloney Electric Co. transformers, voltage 44000/22000 to 440/220. Others from 5 KVA through 75 KVA. Voltage from 7200/120/240, 2400/240/480.

VIBRATORS

1—Allis Chalmers Aero-Bike single deck vibrator, size 1½' x 6'.

1—Stephens Adamson two deck vibrator size 4' x 10'.

1—Doubledeck vibrator size 3' x 6½'.

RAILS

Truckload and car lots of good second hand 16 and 25 lb. rails.

ELECTRIC DRILLS

2—Denver AC Electric coal drills, size 472 phase, 60 cycle, 220 volts.

2—Denver DC electric coal drills, Nos. 472 & 473.

TIPPLE

1—Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

DUCKBILLS

2—G30 Goodman Duckbills, DC.

PIT CAR TRUCKS

200—Seitz Sanford Day Timken roller bearing trucks, 42" gauge, with 14" diameter wheels.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

GAVENDA BROTHERS, Inc.
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2—Goodman Style G20B77 permissible Shaker Conveyors, latest type, with manual type HAD duckbill and 20 HP Westinghouse AC motor, 3 phase, 60 cycle, 220 volt, 1160 RPM.

without line troughs..... $2,800.00 each
with 380' new line troughs..... 4,350.00 each

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NORTON, VIRGINIA

Hotel Norton — Phones 608 & 300

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MOTOR GENERATOR SETS

500 KW G.E. 275 v. 900R—MPC—ATI
2—300 KW G.E. 275 v. 1200R—MPC—ATI
300 KW West. 550 v. 1200R. Syn.
2—200 KW G.E. 275 v. 1200R—MPC—ATI
200 KW G.E. 550 v. 1200R—MPC—ATI
3—150 KW West. 275 v. 1200R. SK—Syn.
150 KW G.E. 550 v. 900R—DLC—ATI
100 KW G.E. 275 v. 1200R—ATI

ROTARY CONVERTERS

150 KW G.E. Rotary, 275 v. HCC4—1200R
200 KW G.E. Rotary, 275 v. HCC4—1200R
300 KW G.E. Rotary, 275 v. HC12—600R

DC GENERATORS

275 KW West. 250 v. 500 RPM
200 KW West. SK 250 v. 600 RPM
150 KW G.E. RC 580 v. 1200 RPM
150 KW Triumph 250 v. 600 RPM
100 KW West. 250 v. 600 RPM

BELT CONVEYORS

30" Goodman, 1800' centers

AC MOTORS

HP	MAKE	SPEED	TYPE	WDG.
500	G.E.	480	MT	S.R.
350	West.	600	CW	S.R.
300	G.E.	480	IM	S.R.
150	G.E.	600	IK	S.C.
150	West.	514	CS	S.C.
150	G.E.	600	ATI	Syn.
2—100	G.E.	450	IM	S.R.
2—100	Al.-Ch.	720	ARX	S.C.
5—100	West.	1200	CS	S.C.
75	G.E.	600	ITC	S.R.

LOCOMOTIVES AND CUTTING MACHINES

25 Ton G.E. 500 v. 42/44" Ga. HM 824
10 Ton Jeff 250 v 36/42" MH110
6 Ton Goodman 250 v. 44/42" Ga. 9184C2
6 Ton Goodman 500 v. 44/42" Ga. 9184C3
5 Ton Westgh. 250 v. 36" Ga. 904
5 Ton G.E. Battery 42/44" Ga.
9½ Ton Ironton Battery 42/44" Ga.
4—5 Ton Goodman 308 250 v. 42/44"
35 ft Jeff. 250 v. Permissible

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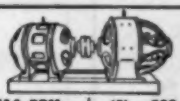
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At A Fraction of Cost

1—Bonnot Coal Crusher, 24" x 30"—2 Rolls — 30 H.P. Motor.
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2—Bonnot Coal Pulverizers, 30"—6 ton each per hour—75 H.P. Motor.
1—Kennedy-Van Saun Coal Pulverizer — 10 ton per hour—200 H.P. Motor — Current: 550 v. 3 ph. 60 cy.

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(5) 1,000 KW — 600 V — 514 RPM
500 KW — 250 V — 1,200 RPM
500 KW — 125 V — 720 RPM
500 KW — 250 V — 720 RPM
300 KW — 250 V — 1,200 RPM
250 KW — 250 V — 1,200 RPM
200 KW — 125 V — 720 RPM
Plus Many Smaller Units

ROTARY CONVERTERS

(5) 500 — 250 GE-HCC — 6
(7) 400 — 250 West — 1,200 RPM
(1) 100 — 250 G E — 1,200 RPM

We Also Stock: * DC to AC Sets
* Frequency Changers * LV Sets

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and scrap the rest

3—Joy 14 BU Loaders, Late Type, Low Pedestal.
3—Joy 12 BU Loaders, 250 Volts.
4—Joy T-2 Low-pan Cat Trucks.
2—Joy 30" Chain Conveyors, 300' Ea.
1—Hammond 10" Bit Grinder.
1—Jeffrey Rope & Button Conveyor, 1000' centers.
15—Drop Bottom 44" Ga. Mine Cars.
40—End Dump 48" Ga. Low-Vein Mine Cars.
20—End Dump 42" Ga. Low-Vein Mine Cars.
Loading Booms—24", 30" and 36".
Picking tables, shaker screens, vibrators.
New Ingersoll Rand 105 Cu. Ft. Compressor.
Rock Dusters, Mine Fans, Pumps, Compressors, Coal Drills, Stationary Motors AC and DC.
Drill Presses, Power-Saw, Pipe.
25, 50 and 75 H.P. Incline Hoists.
Coal Crushers, Wilmot and Link-Belt.
600 Five Gallon G.I. Cans.
Storage Tank, 12,000 Gallon.

2—Dump Trailers, 15 Ton capacity with Mack Tractors.
1—G.E. 801 Locomotive, 42" Ga., with reel—6 Ton.
1—G.E. 801 Locomotive, 48" Ga., Armor Plate Frame, 29" above Rail—6 Ton.
1—G.E. 822 Locomotive, 44" Ga., 8 Ton. 2" Armor Plate Frame.
42", 44" and 48" Ga. Steel Ties—25, 40 and 54 #.
1—Jeffrey 35-B Shortwall Machine with truck.
4—Goodman Standard 12AA Shortwall Machines.
1—Goodman 112AA Universal Machine, 250 Volts.
1—G.E. 200 KW Rotary Converter, 250 Volts DC.
1—Westinghouse MG Set, 50 KW, 250 Volts.
1—Westinghouse MG Set, 30 KW, 250 Volts.
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5,000 ft. 2/0
2,000 ft. 1/0

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Item 3: 2—Joy Type T2-6PE Cat Trucks.
Item 4: 3—Jeffrey 56A Coal Drills.
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200	Westg.		900
175	G. E.	MD	450
150	Westg.	SK	500
125	G. E.	CD	440
125	Century	drip proof	1000
100	Westg.	SK-100	500
100	Westg.	S	655
75	G. E.	CDM	1000
60 NEW	G. E.	DC—splash proof	850
40 NEW	West.	SK-120	850

D.C. Generators—230-275 V.

KW	MAKE	TYPE	SPEED
250	West.	SK-216	600
200	West.	SK	600
150	Westg.	SK	690
110	Westg.	SK-100	750
100	Westg.	SK	720
100	Westg.	S	850
100	G. E.		1000
75	Allis Chalmers		720
75	Westg.	S	850
75	Allis Chalmers		850
60 NEW	G. E.	CD	1150
40 NEW	Westg.	SK-123	1150

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6	333	Maloney	2300	230/460
3	300	G.E.	2400/4160Y	240/480
3	150	West.	2400/4160Y	240/480
2	150	Pgh.	2300	230/460
1	100	Fourinus	2300	230/460
3	75	West.	2300	230/460
1	75	West.	13200/6600	2300
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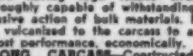
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8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
36"	5	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.

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CONVEYORS — IDLERS

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18" belt	$2.00	36" belt	$5.00
	42" belt	$30.00	

1-roll Return Idlers for these sizes:

24" belt	$ 9.00	36" belt	$10.00
30" belt	10.00	42" belt	11.00
	48" belt	$12.00	

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COAL AGE ADVERTISERS IN THIS ISSUE

MORE INFORMATION on any product advertised in COAL AGE may be easily secured by using the postage-free card facing p 113.

*Acker Drill Co. 132
*Allen & Garcia Co. 20
*Allis-Chalmers Mfg. Co. 33, 123
*Allis-Chalmers Tractor Div. ....12B, C, D, E
*American Brattice Cloth Corp. 166
American Cable Div., American Chain & Cable Co. ..... Third Cover
*American Car & Foundry Co. ..Second Cover
*American Crucible Products Co. 164
American Optical Co. 161
*American Pulverizer Co. 157
Armstrong-Bray Co. 170
*Atlas Car & Mfg. Co. 130
Atlas Powder Co. 120A
Aurora Pump Co. 178

Baker Mfg. Co. 12F, 13
Baker-Raulang Co. 167
*Bemis Bro. Bag Co. 162
*Bethlehem Steel Co. 12, 159
*Bird Machine Co. 4
*Blaby-Zimmer Engrg. Co. 148
Bonded Scale Co. 166
Boston Woven Hose & Rubber Co. 38
*Bowdil Co. 16

Campbell Co., E. K. 179
Cardox Corp. 22-23
*Carlon Products Co. 44
Caterpillar Tractor Co. 36
Central Mine Equipment Co. 143
Centrifugal & Mechanical Industries, Inc. 186
Cheatham Electric Switching Device 183
Chevrolet Motor Div., General Motors Corp. 28
Chicago Perforating Co. 182
*Cincinnati Electrical Tool Co. 179
Cincinnati Mine Machinery Co. 131
Cities Service Oil Co. 133
*Colorado Fuel & Iron Co. 29
Colorado Iron Works 177
*Connellsville Mfg. & Mine Supply Co... 136
*Crane Co. 169
Crescent Belt Fastener Co. 168
*Cummins Engine Co. 147

*Denver Equipment Co. 48
*Detroit Diesel Engine Div., General Motors Corp. 17
*Dings Magnetic Separator Co. 176
Dodge Manufacturing Co. 173
du Pont de Nemours & Co., E. I. (Explosives Div.) 107
Durabool, Inc. 162

Eaton Mfg. Co. ..Insert between pp. 130-121
*Eimco Corp. 174
*Electric Storage Battery Co. 91
Elreco Corp. 181
*Ensign-Bickford Co. 52

*Farmers Engrg. & Mfg. Co. 152
Firth Sterling Steel & Carbide Co. 96
Flexible Steel Lacing Co. 179
*Flood City Brass & Electric Co. 160
Foster Co., L. B. 184

*Gar Wood Industries, Inc. 12A
Gates Rubber Co. 51
*General Electric Co., Apparatus Dept. 14-15
*Goodman Mfg. Co. 10-11
Goodrich Co., B. F. 1, 99
Goodyear Tire & Rubber Co. 25
Gould National Batteries, Inc. 93
Greensburg Machine Co. 184
Gulf Oil Corp. 43
Gulf Refining Corp. 43
Guyan Machinery Co. 164

Hammond Co., J. V. 180
Harnischfeger Corp. 41
*Hazard Insulated Wire Works. 123
*Hendrick Mfg. Co. 160
Hewitt-Rubber of Buffalo, Div. of Hewitt-Robins, Inc. 145
Hercules Powder Co. 141
*Hoffman Bros. Drilling Co. 179
Hollingshead Corp., R. M. 171
*Holmes & Bros., Inc., Robt. 142
Hulburt Oil & Grease Co. 2-3

*Indiana Foundry Co. 181
International Harvester Co. 115

*Jeffrey Mfg. Co. .....
.....Insert between pp. 20-21, 105
*Jenkins Bros. 95
Johnson Plastic Corp. 110
Jones & Laughlin Steel Corp. 30, 109
*Joy Mfg. Co. .....
.....Insert between pp. 36-37, 117, 182

*Kennametal, Inc. 103
*Koehring Co. 34-35

LeTourneau, Inc., R. G. 30-31
Lee-Norse Co. 138
*Leschen & Sons Rope Co., A. 139
*Lima Shovel and Crane Div., Baldwin-Lima-Hamilton Corp. 175
*Link-Belt Co. .....Fourth Cover
Lovejoy Flexible Coupling Co. 144
Lubriplate Div., Fiske Bros. Refining Co. 178

Mack Trucks, Inc. 101
McGraw-Hill Book Co. 178, 180
*McGraw-Hill Catalog Service 170
*Mine Safety Appliances Co. 18-19
*Mosebach Electric & Supply Co. 130
*Mott Core Drilling Co. 166
*Myers-Whaley Co. 42

Nashod and U. S. Signal Co. 182

Ohio Brass Co. ....Insert between pp. 96-97

Paris Mfg. Co. 149
*Pennsylvania Crusher Co. 112
Pennsylvania Drilling Co. 180

*Quaker Rubber Corp. 49

Republic Rubber Div., Lee Rubber & Tire Corp. 165
Remaly Mfg. Co., Inc. 168
Robins Conveyor Div., Hewitt-Robins, Inc. 135
*Rockbestos Products Corp. 163
*Rome Cable Co. 46-47
*Ruberoid Co. 170
Rust-Oleum Corp. 21

*Salem Tool Co. 45
*Sanford-Day Iron Works 8-9
*Screen Equipment Co. 146
Searchlight Section 182-187
*Simplex Wire & Cable Co. 32
Sintering Machinery Co. 162
*Sprague & Henwood, Inc. 158
Standard Oil Co. (Indiana) 137
Stearns Magnetic Mfg. Co. 111
Sun Oil Co. 114
Syntron Co. 140

Templeton-Kenly & Co. 129
Texas Co. 6-7
*Thermoid Co. 127
Tide Water Associated Oil Co. 145
*Timken Roller Bearing Co. 26-27

United Engineers & Constructors, Inc... 135
United States Rubber Co. 153

Victaulic Co. of America 108
Viking Machinery Sales Corp. 180
*Vulcan Iron Works 37

Walworth Co. 24
*Wedge-Wire Corp. 168
*Western Machinery Co. 129
*Westinghouse Elec. Corp. 30, 119
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 29
*Willson Products, Inc. 156
*Wilmot Engrg. Co. 151
Winslow Scale Co. 181

■

PROFESSIONAL SERVICES 172

■

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 182
Positions Wanted 182

BUSINESS OPPORTUNITIES
Offered 182

EQUIPMENT
(Used or Surplus New)
For Sale 182

WANTED
Equipment 182

ADVERTISERS INDEX

Benney Equipment Co., R. H. 184
Bonded Scale & Machine Co. 137

Carlyle Rubber Co., Inc. 187
Clarke Coal Co. 182

Duquesne Electrical & Mfg. Co. 187

Electric Equipment Co. 185
Electric Service Co., Inc. 186

Falk Machinery Co. 186
Fish & Co., J. T. 183, 186
Florence Machinery & Supply Co. 184
Foster Co., L. B. 184
Frank, M. K. 184
Freebrook Corp. 186
Freeport Gas & Coal Co. 187

Gavenda Brothers, Inc. 185
Gillespie, Thomas 183
Greensburg Machine Co. 184

Hawkins & Co. 184

Industrial Equipment Corp. 184
International Salt Co., Inc. 187

Kaiser Steel Corp. 185
Kirk Co., Wallace E. 183

Land, Inc., L. J. 186
Lefton Industrial Corp. 184
Locke Co., C. B. 186

MacCabe Co., T. B. 183
McKees Rocks Industrial Enterprises..... 185
McNees, R. T. 185
Midwest Steel Corp. 184
Mississippi Valley Equipment Co. 183
Moorhead Electrical Machinery Co. 185

Nacho Coal Co. 186

Rodeo Coal Co. 186

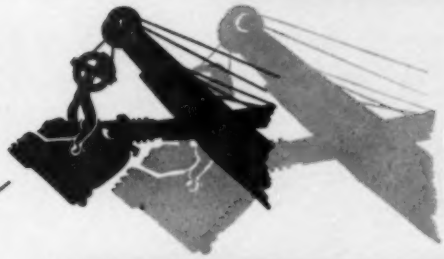
Stephenson & Co., Dell 187
Swabb Equipment Co., Inc., Frank..... 184

T-J-Equipment Co. 186
Tippins Machinery Co. 184
Tomsett Associates 182
Tuckahoe Mining Co., Inc. 182

Usona Construction Co. 186

*Indicates that detailed information may be found in the 1949-50 MINING CATALOGS.

This index is published as a convenience to the reader. Every care is taken to make it accurate, but C. A. assumes no responsibility for errors or omissions.



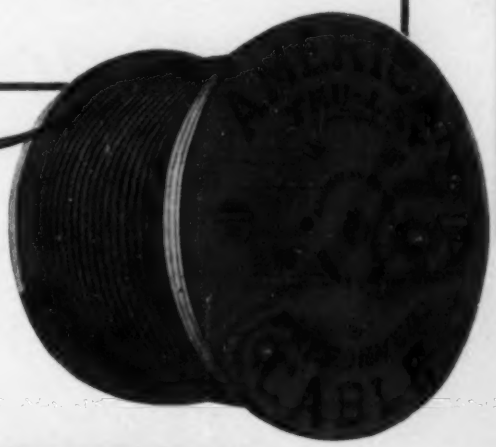
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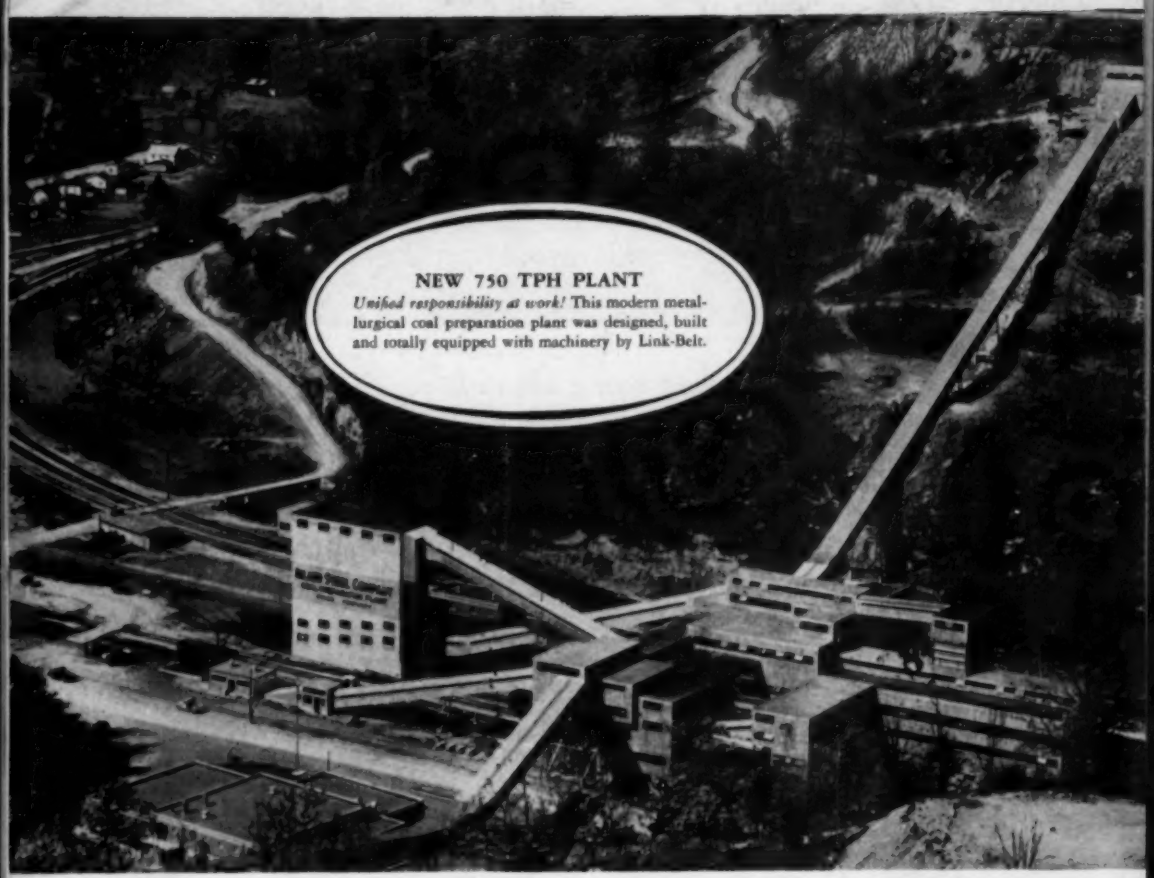
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